Installation and Service Instructions

for use by heating contractor

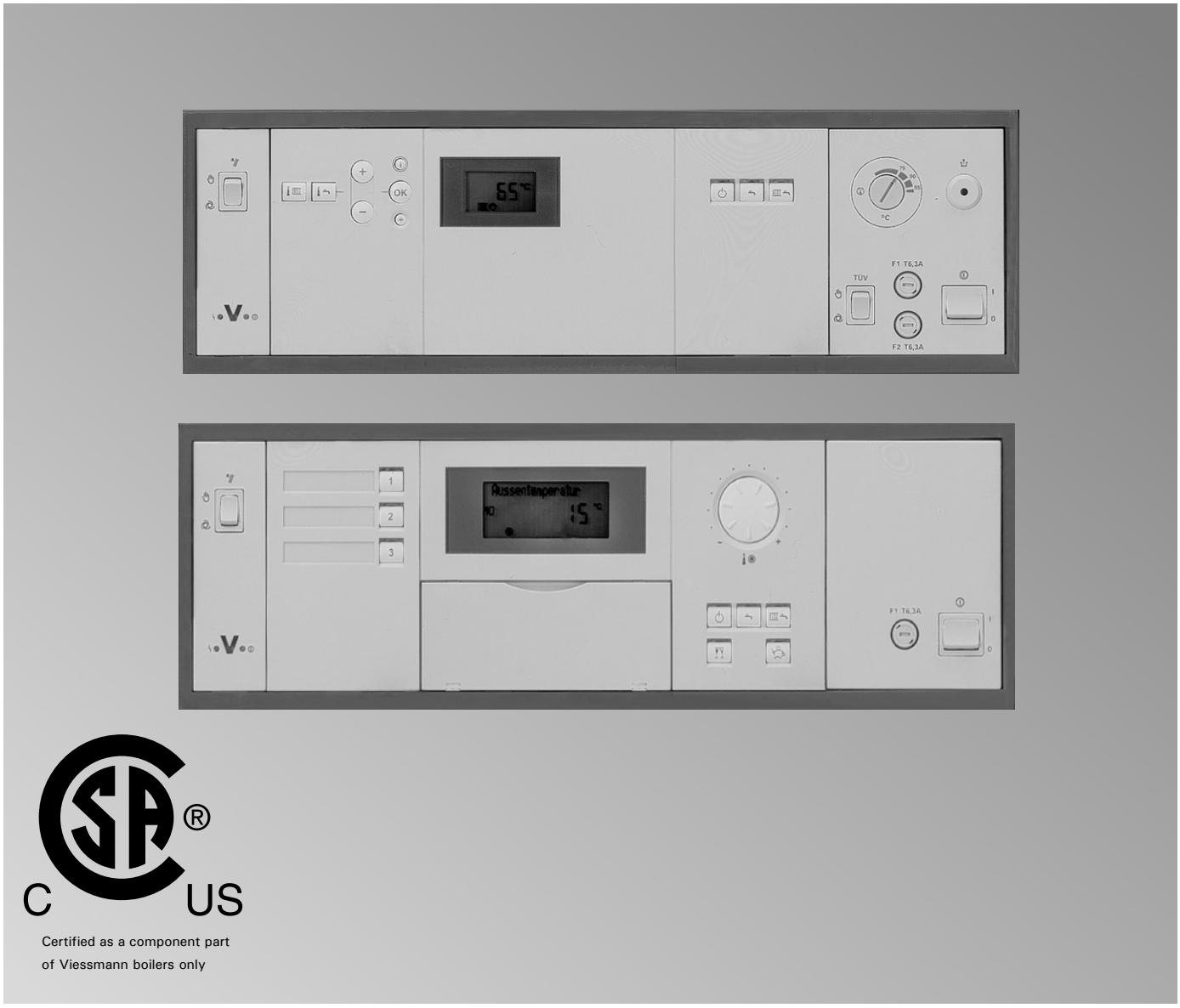
VIESMANN

Please file in Service Binder

Vitotronic 100, Model GC1
Digital boiler control unit

Vitocontrol-S, VD2 / VD2A / CT3, CM2 Model 300-K MW1
Outdoor-reset logic digital cascade control

VITOTRONIC 100, GC1
VITOCONTROL-S, VD2/CT3/CM2



C SA® US

Certified as a component part
of Viessmann boilers only

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Safety, Installation and Warranty requirements

Please ensure that this manual is read and understood before commencing installation. Failure to comply with the issues listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

Licensed professional heating contractor
The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

■ *Please see section entitled "Important Regulatory and Installation Requirements."*

Advice to owner
Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

Product documentation
Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

■ *For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements."*

Warranty
Information contained in this and related product documentation must be read and followed. *Failure to do so renders warranty null and void.*

Safety Terminology

The following terms are used throughout this manual to bring attention to the presence of potential hazards or important product information. **Please heed the advice given!**

DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial product / property damage.

WARNING
Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product / property damage.

CAUTION
Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product / property damage.

IMPORTANT
Helpful hints for installation, operation or maintenance which pertain to the product.

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Product information

Vitotronic 100, GC1, and Vitocontrol-S, VD2/CT3/CM2
Only for integration/installation on Viessmann boilers and for wall mounting.

Connecting the Input Module 0 to 10 V (Part No. 7134 561) is only possible from **software version 7** upwards.

These application examples are only recommendations, and must therefore be checked on site for completeness and function.

Vitotronic 100, GC1, without LON communication module as part of the standard delivery.
LON module (Part No. 7172 173) has to be ordered separately.
Vitocontrol-S, VD2/CT3/CM2, Model 300-K MW1, with integral LON communication module.

Safety

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING," "CAUTION," and "IMPORTANT". See pages 2 and 7 for details.

Approvals
Viessmann boilers, burners and controls are approved for sale in North America by CSA International.

→ *Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.*

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

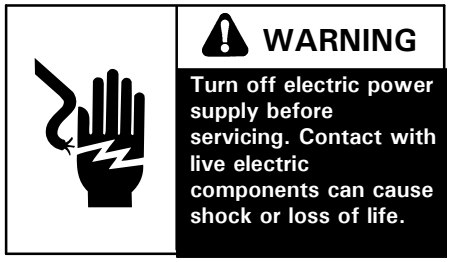
Codes
The installation of this unit shall be in accordance with local codes. In the absence of local codes, use:
- CSA C22.1 Part 1 and/or local codes in Canada
- National Electrical Code ANSI/NFPA 70 in the U.S.

Always use latest editions of codes.

Working on the equipment
The installation, adjustment, service, and maintenance of this product must be done by a **licensed professional heating contractor** who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burner, or control.

→ *The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.*

Ensure **main power** supply to equipment, the heating system, and all external controls has been **deactivated**. **Close** main **oil or gas supply valve**. Take precautions in both instances to avoid accidental activation of power during service work.


WARNING
Turn off electric power supply before servicing. Contact with live electric components can cause shock or loss of life.

Technical literature
Literature applicable to all aspects of the Vitocontrol S, VD2/CT3/CM2:
- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions
- Instructions of other Viessmann products utilized and installed
- Installation codes mentioned in this manual

→ *Leave all literature at the installation site and advise the system operator/ ultimate owner where the literature can be found. Contact Viessmann for additional copies.*

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Important regulatory and installation requirements

Power supply
Install power supply in accordance with the regulations of the authorities having jurisdiction or, in the absence of such requirements, in accordance with National Codes. Viessmann recommends the installation of a disconnect switch to the 120 VAC power supply outside of the boiler room. The installer must provide maximum 15 A overcurrent protection for the 120 VAC power supply (fuse or circuit breaker).

Working with an open control
No static discharge to the internal componentry must ever occur when working with opened control equipment.

About these installation instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING
Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

CAUTION
Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

→ *Cautions draw your attention to the presence of potential hazards or important product information.*

IMPORTANT

→ *Helpful hints for installation, operation or maintenance which pertain to the product.*

→

→ *This symbol indicates that additional, pertinent information is to be found in column three.*

→ *This symbol indicates that other instructions must be referenced.*

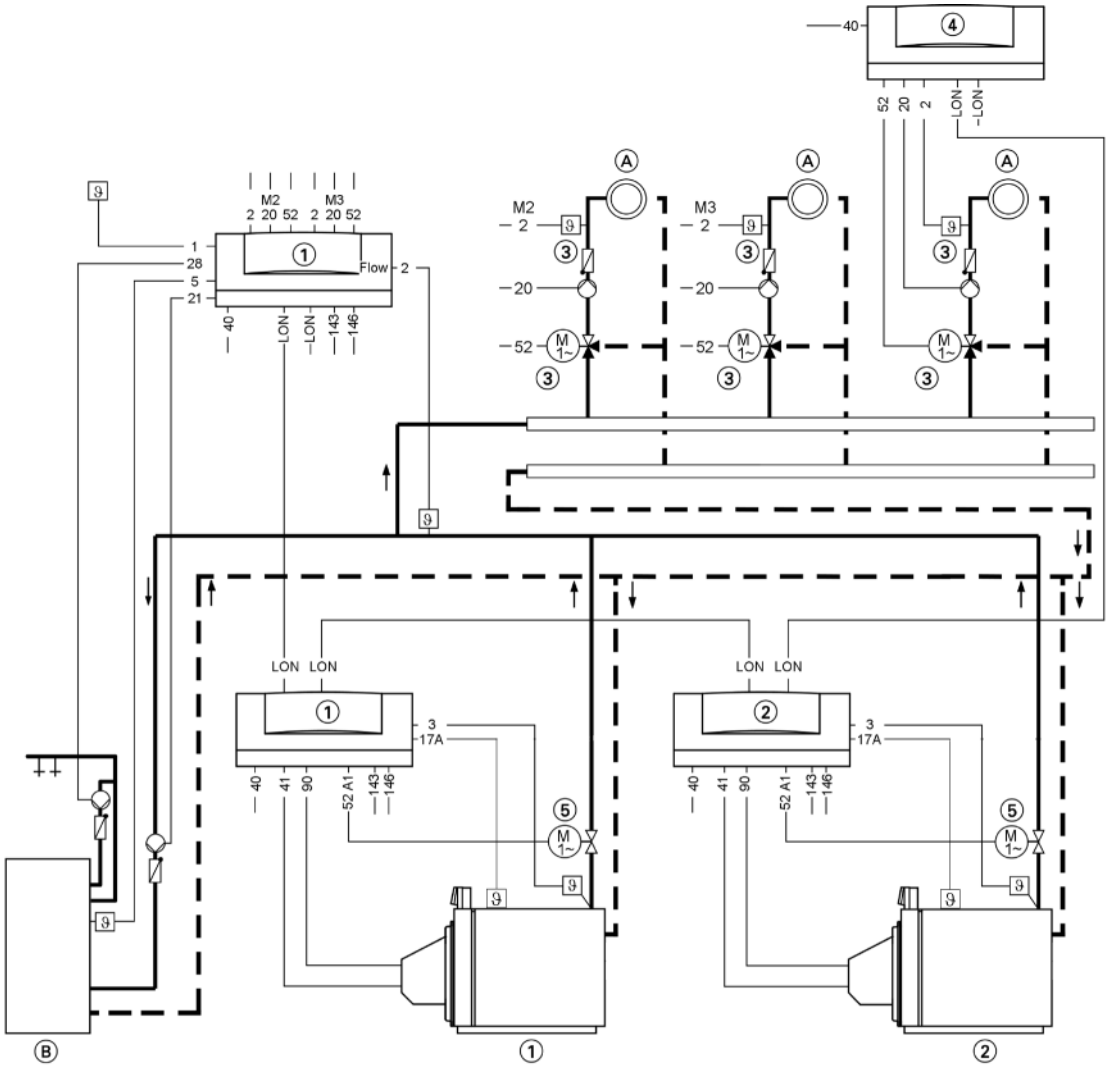
Summary of system versions

	Boiler	Characteristics	Page
1	Vitorond 200, VD2A	With Therm-Control and 3-way mixing valve	9
2	Vitorond 200, VD2	Shunt pump for controlling return temperature for each boiler	10
3	Vitorond 200, VD2	Common supply pump and low-pressure manifold	12
4		Three-way mixing valve for controlling return temperature	15
5		Low loss header and three-way mixing valve for controlling return temperature	17
6	Vitocrossal 300	Several heating circuits and one low temperature heating circuit	19
7	Vitocrossal 300, Vitorond	Several heating circuits, one low temperature heating circuit plus Vitorond with shunt pump	22
8	Vitocrossal 300, Vitorond	Three-way mixing valve, several heating circuits and one low temperature heating circuit	25
9	Vitocrossal 200,	Several heating circuits,	28
10	Vitocrossal 200, Vitorond	Several heating circuits, one low temperature heating circuit plus Vitorond with shunt pump	31

Please note that the following examples are simplified conceptual drawings only!
Piping and necessary componentry must be field verified.
A low water cut off (LWCO) must be installed where required by local codes.
Proper installation and functionality in the field is the responsibilty of the heating contractor.

System Version 1

Vitorond 200, VD2A



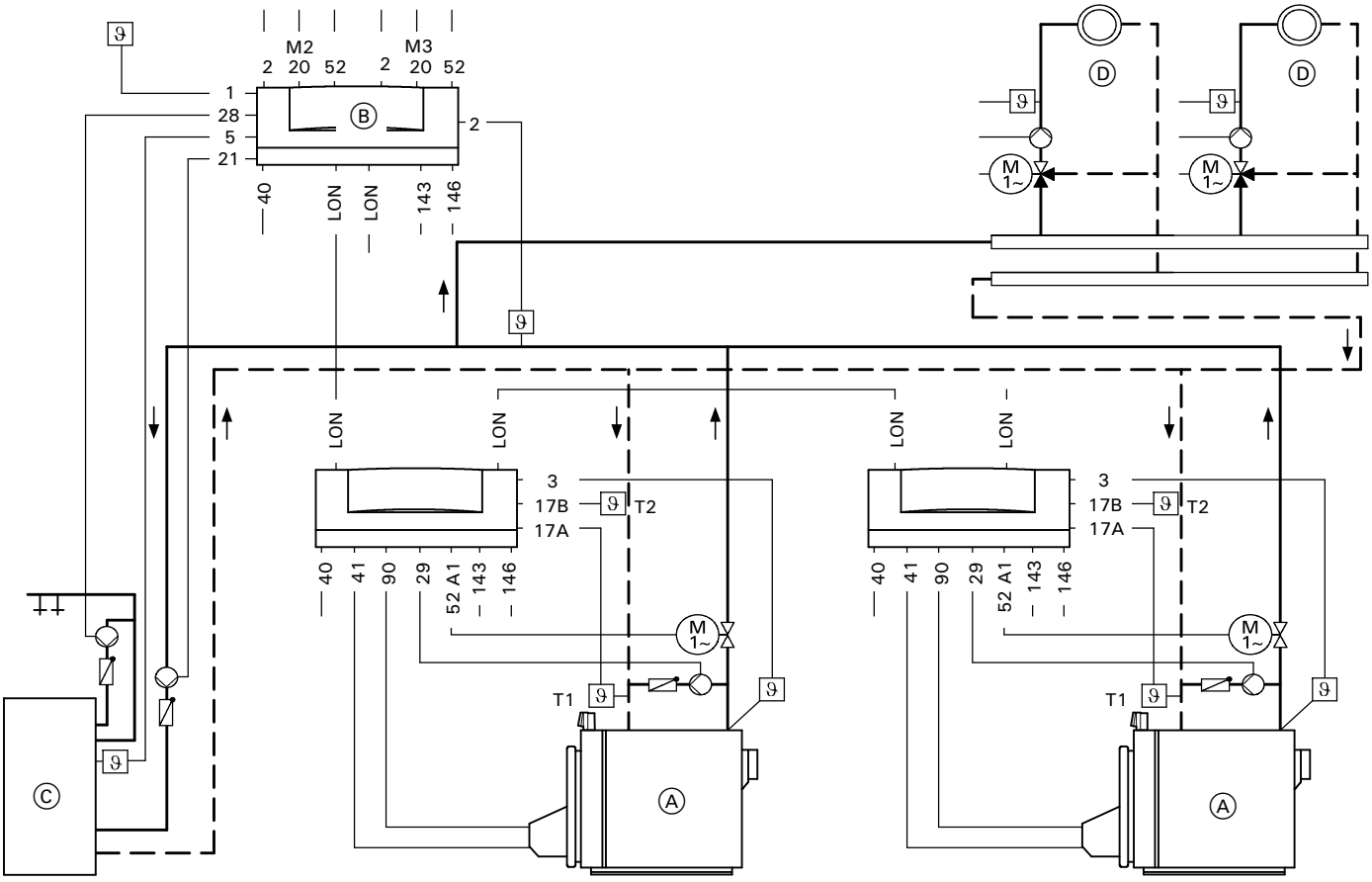
LON LON connection (available connections with terminator)
Ⓐ Heating circuit with mixing valves
Ⓑ DHW tank

Plug

1	Outdoor temperature sensor (only for Vitotronic 300-K)
2 Flow	Flow temperature sensor, common heating flow (only for the Vitotronic 300-K)
2 M2	Flow temperature sensor, mixing valve (only for the Vitotronic 300-K)
2 M3	Flow temperature sensor, mixing valve (only for the Vitotronic 300-K)
2	Flow temperature sensor Vitotronic 200-H
3	Boiler water temperature sensor
5	DHW tank temperature sensor (only for Vitotronic 300-K)
17 A	Therm-Control temperature sensor
20 M2	Heating circuit pump, mixing valve (only for Vitotronic 300-K)
20 M3	Heating circuit pump, mixing valve (only for Vitotronic 300-K)
20	Heating circuit pump Vitotronic 200-H
28	DHW circulation pump (only for the Vitotronic 300-K)
40	Power supply, 120 VAC 60 Hz Install the main isolator in accordance with regulations
41	Burner (stage 1)
52 A1	Motorized butterfly valve
52 M2	Mixing valve motor (only for Vitotronic 300-K)
52 M3	Mixing valve motor (only for Vitotronic 300-K)
52 M3	Mixing valve motor, Vitotronic 200-H
90	Burner (burner stage 2 / mod.)
143/146	External connections (see page 44)

System version 2

Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit

Plug

1	Outdoor temperature sensor
2	Supply temperature sensor common heating supply
2 M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3	Boiler temperature sensor
5	DHW tank temperature sensor
17 A	Temperature sensor T1
17 B	Temperature sensor T2
20 M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21	DHW pump
28	DHW recirculation pump
29	Shunt pump
40	Power supply, 120 VAC, 60 Hz
41	Burner (burner stage 1)
52 A1	Motorized isolation valve
52 M2/M3	Mixing valve actuator circuit 2 or 3
90	Burner (burner stage 2 / mod.)
143/146	External connections (see page 44)

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System version 2 *(continued)*

Codings must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Oil fired operation (non-reversible)*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A: 1	Connecting the T1 temperature sensor to plug 17 A
4b: 1	Connecting the T2 temperature sensor to plug 17 B

Vitocontrol-S, VD2, CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1

*1 *If required.*

Possible applications

Heating systems with distribution manifold installed close to the boiler. The boiler water volume flow will be reduced via the motorized isolation valve.

Temperature sensor T2 activates the shunt pump if the required minimum return temperature is not reached. If this fails to achieve the required minimum return temperature, the boiler water volume flow must be reduced by at least 50 % via temperature sensor T1, via the isolation valve or the heating circuit control units. Where the T1 temperature sensor cannot affect the motorized isolation valves, it must, instead, regulate the mixing valves of the heating circuits downstream.

Size the shunt pump to approx. 30 % of the total throughput capacity of the boiler.

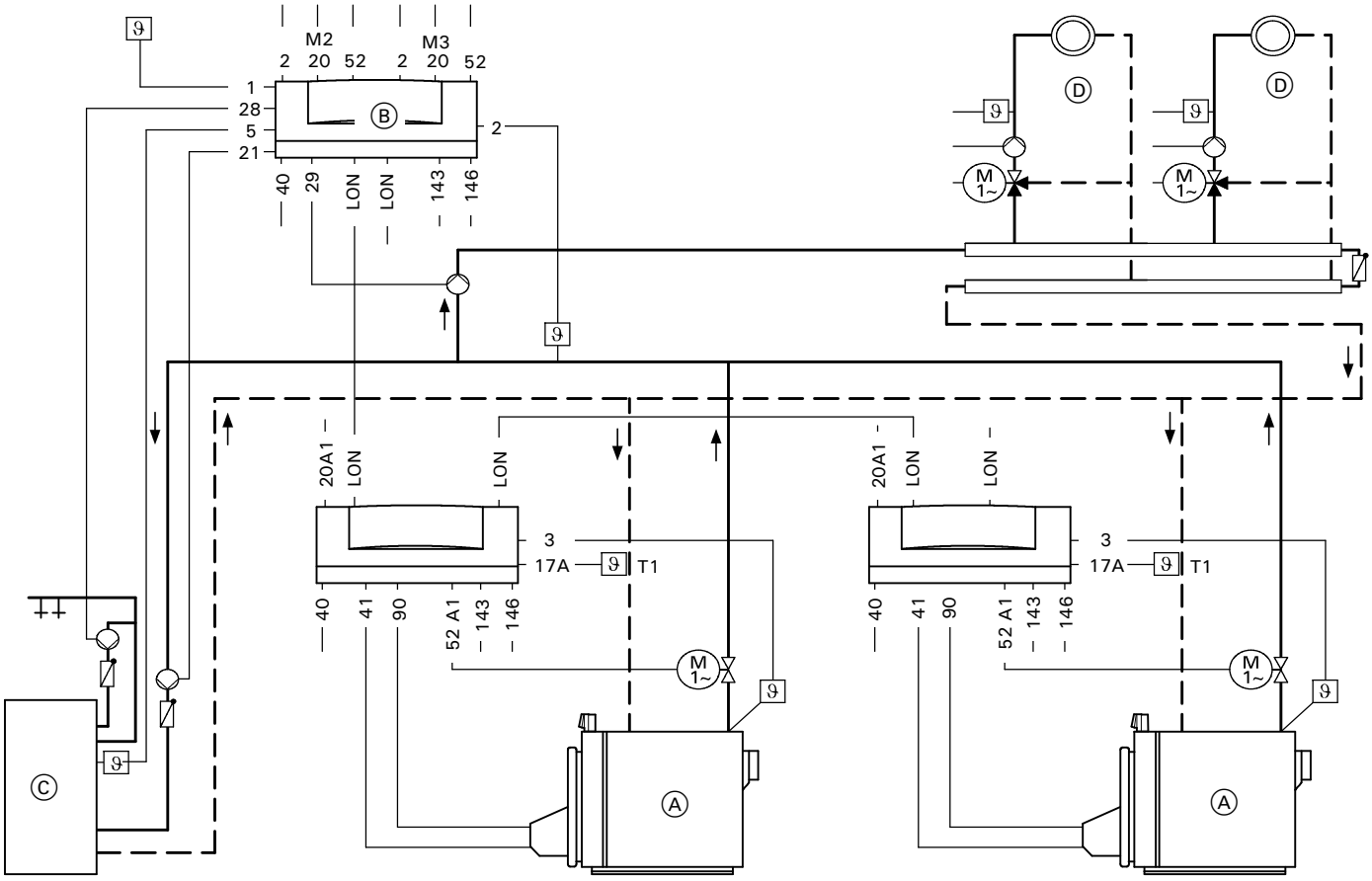
The boiler receives optimum protection when controlling the heating circuits via Vitocontrol-S, VD2/CT3/CM2 or a Vitotronic 050 connected to the boiler control unit. No additional on-site protective measures are required.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 3

Common supply pump and low pressure distribution manifold
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit

Plug

1	Outdoor temperature sensor
2	Supply temperature sensor common heating supply
2 M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3	Boiler temperature sensor
5	DHW tank temperature sensor
17 A	Temperature sensor T1
20 A1	Closing the mixing valves with external heating circuit control units
20 M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21	DHW pump
28	DHW recirculation pump
29	Common supply pump
40	Power supply, 120 VAC 60 Hz
41	Burner (burner stage 1)
52 A1	Motorized isolation valve
52 M2/M3	Mixing valve actuator circuit 2 or 3
90	Burner (burner stage 2 / mod.)
143/146	External connections (see page 44)

System version 3 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Oil fired operation (non-reversible)*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0d : 1	Therm-Control controls the mixing valves of downstream heating circuits
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A: 1	Connecting the T1 temperature sensor to plug 17 A

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
4d: 0	Common supply pump on plug 29

*1 *If required.*

System version 3 *(continued)*

Possible applications
If the distribution manifold is located in a remote location (> 20 m / 65 ft). The heat transfer to the heating circuits must be able to be reduced.

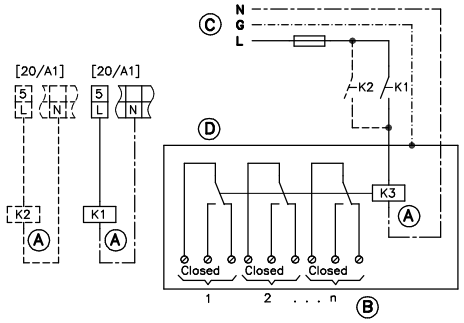
Temperature sensor T1 reduces or closes the mixing valves if the required minimum return temperature is not achieved. Size the common supply pump to 110% of the total flow rate of the heating system.

The boiler receives optimum protection when controlling the heating circuits via Vitocontrol-S, VD2/CT3/CM2 or a Vitotronic 050 connected to the boiler control unit. No additional on-site protective measures are required.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

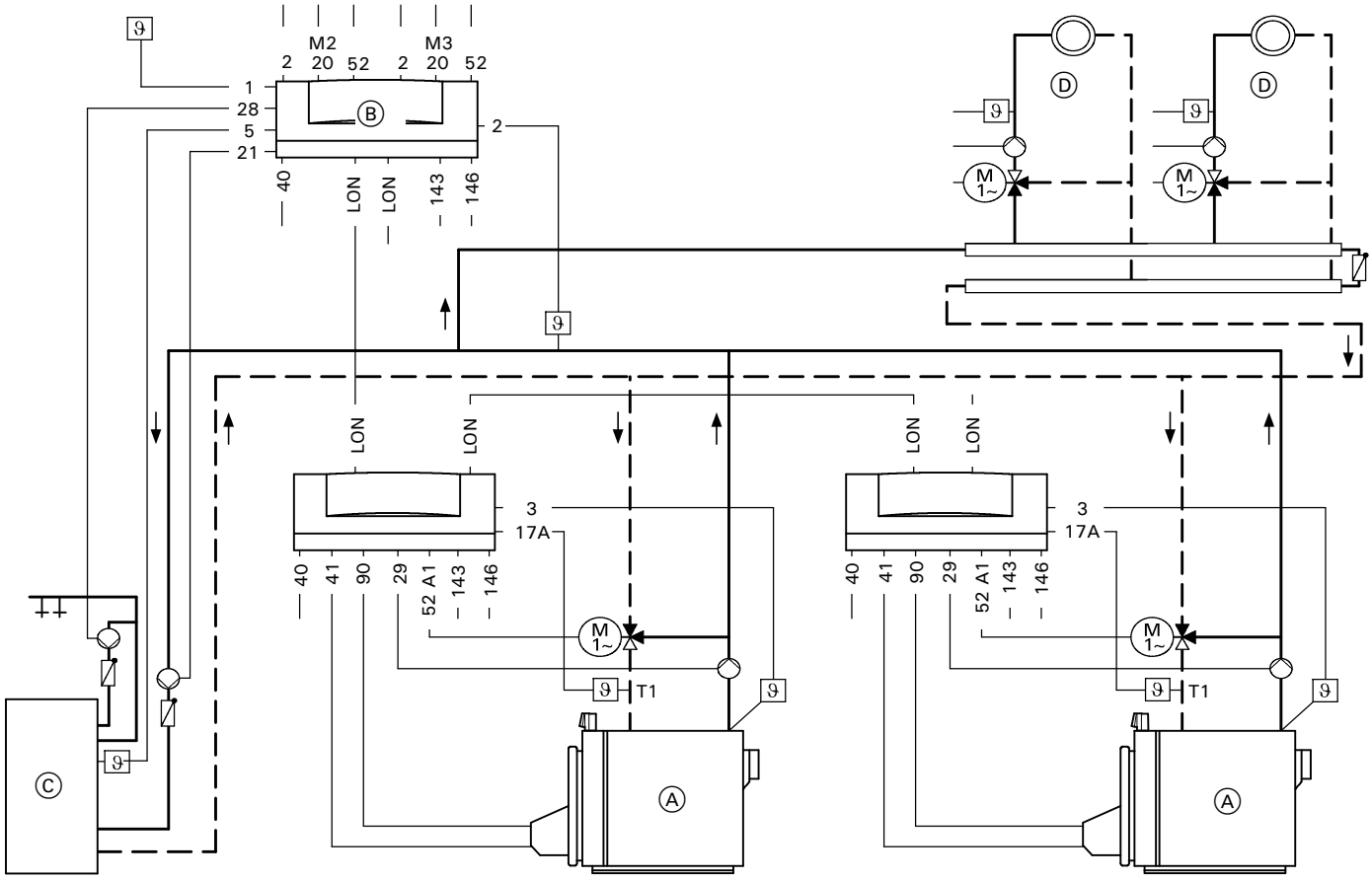
Temperature sensor T1
Wiring diagram for reducing the volume flow rate in heating systems with heating circuit control units, which are not connected to the boiler control unit via the LON BUS.
Necessary coding: 0D: 1 and 4C: 2.



20 A1 Closing mixing valves (Vitotronic 100, GC1)
Ⓐ Contactor relay, field supplied
Ⓑ Downstream heating circuit control unit
Switching contact closed: signal for close mixing valve(s)
Ⓒ Power connection 120 VAC 60 Hz
Ⓓ Junction box, field supplied

System version 4

Controlling the return temperature with a 3-way mixing valve
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit

Plug

1		Outdoor temperature sensor
2		Supply temperature sensor common heating supply
2	M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
20	M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21		DHW pump
28		DHW recirculation pump
29		Boiler circuit pump
40		Power supply, 120 VAC 60 Hz
41		Burner (burner stage 1)
52	A1	Three-way mixing valve
52	M2/M3	Mixing valve actuator circuit 2 or 3
90		Burner (burner stage 2 / mod.)
143/146		External connections (see page 44)

System version 4 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Oil fired operation (non-reversible)*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0C: 1	Constant regulation of the return temperature
4d: 2	Boiler circuit pump on plug 29
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A: 1	Connecting the T1 temperature sensor to plug 17 A

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1

*1 *If required.*

Possible applications

For example, older heating systems or systems in nurseries and/or systems where downstream heating circuits cannot be controlled.

Temperature sensor T1 closes the three-way mixing valve in proportion and therefore protects the boiler, if the required minimum return temperature is not achieved.

Please note:

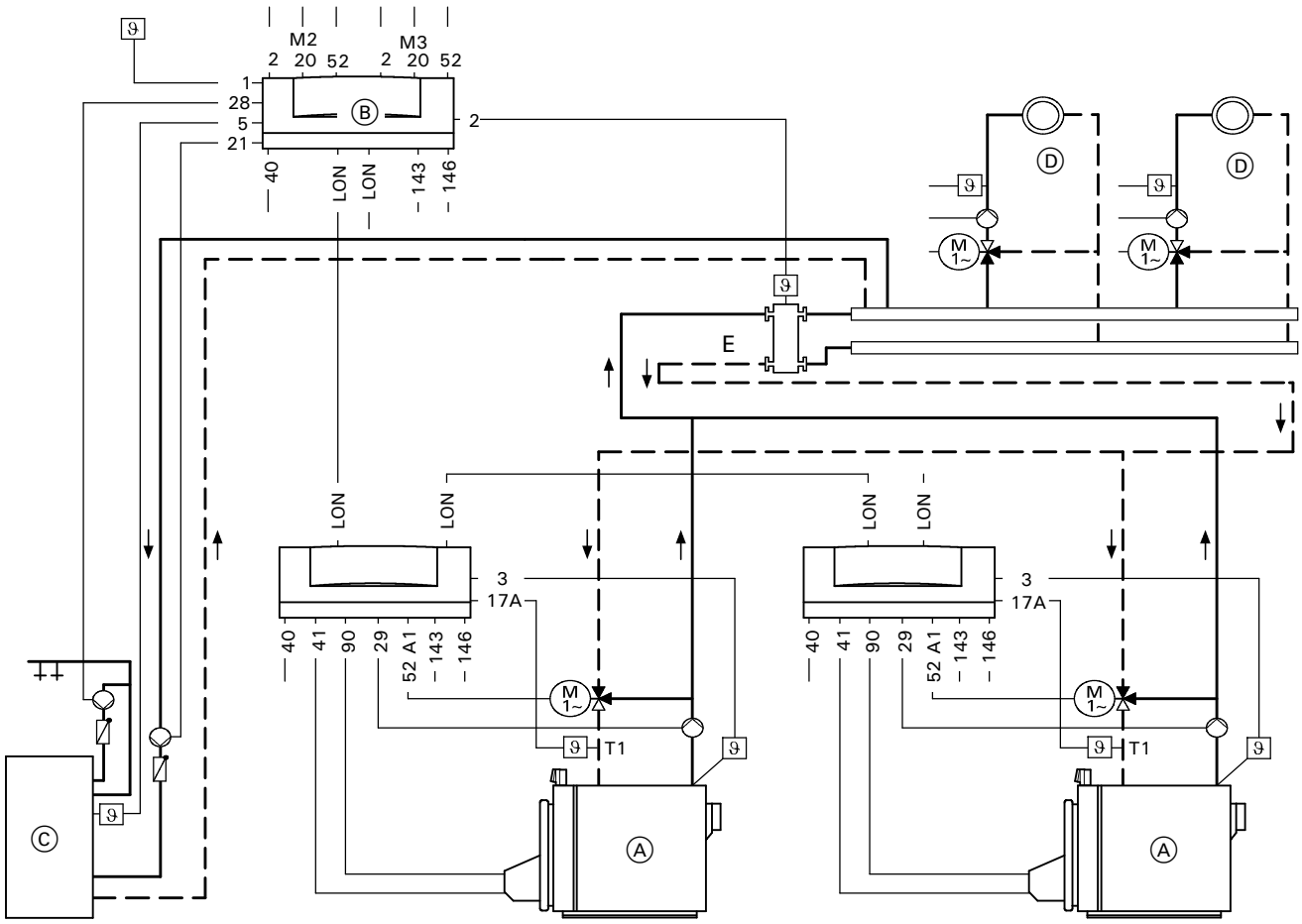
Size the boiler circuit pump for each boiler so that their volume flow rate is at least as large as the max. total heating circuit volume flow rate.
Recommendation: 110%

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 5

Controlling the return temperature with a low loss header and a three-way mixing valve
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓔ Low loss header
Ⓓ Mixing valve circuit

Plug

1		Outdoor temperature sensor
2		Supply temperature sensor common heating supply
2	M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
20	M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21		DHW pump
28		DHW recirculation pump
29		Boiler circuit pump
40		Power supply, 120 VAC 60 Hz
41		Burner (burner stage 1)
52	A1	Three-way mixing valve
52	M2/M3	Mixing valve actuator circuit 2 or 3
90		Burner (burner stage 2 / mod.)
143/146		External connections (see page 44)

System version 5 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Oil fired operation (non-reversible)*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0C: 1	Constant regulation of the return temperature
4d: 2	Boiler circuit pump on plug 29
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A: 1	Connecting the T1 temperature sensor to plug 17 A

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1

*1 *If required.*

Possible applications
For example, older systems or systems in nurseries and/or systems, where the hydraulic conditions cannot be clearly defined and/or systems where downstream heating circuits cannot be controlled.

Temperature sensor T1 closes the three-way mixing valve in proportion and therefore protects the boiler, if the required minimum return temperature is not achieved. The temperature sensor in the low loss header controls the supply temperature.

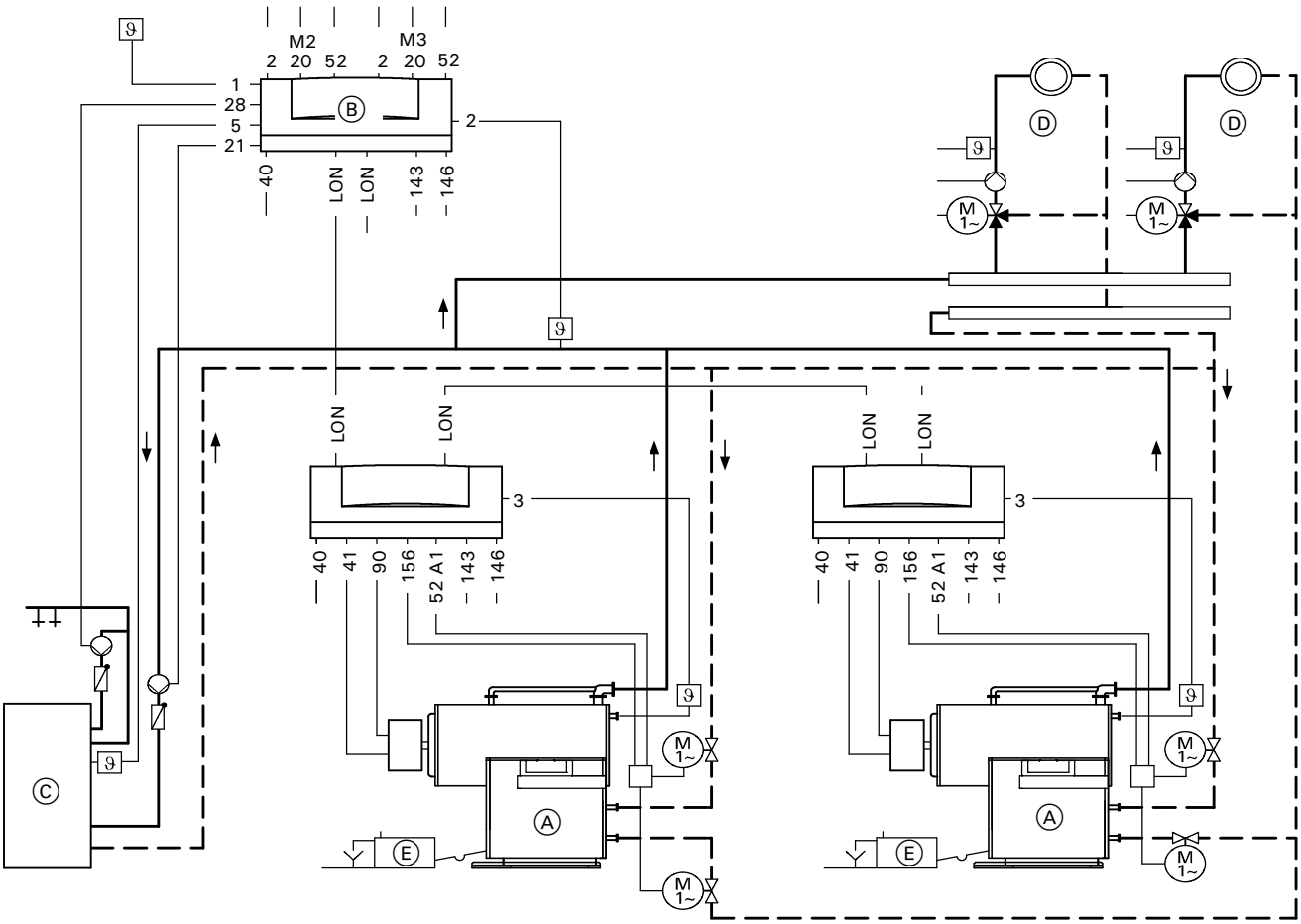
Please note:
Size the boiler circuit pumps for each boiler so that their volume supply is at least as large as the max. total heating circuit volume supply.
Recommendation: 110%

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 6

Heating circuit and one low temperature heating circuit
Vitocrossal 300, CT3



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit
Ⓔ Neutralizing system

Plug

1		Outdoor temperature sensor
2		Supply temperature sensor common heating supply
2	M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
90		Burner (burner stage 2 / mod.)
20	M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21		DHW pump
28		DHW recirculation pump
40		Power supply, 120 VAC 60 Hz
41		Burner (burner stage 1)
52	A1	Motorized isolation valve
52	M2/M3	Mixing valve actuator circuit 2 or 3
143/146		External connections (see page 44)

System version 6 *(continued)*

Codings must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0d: 0	Without Therm-Control
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
3C: 0	Condensing strategy

*1 *If required.*

System version 6 *(continued)*

Possible applications
Vitocrossal 300 is operated via a Viessmann boiler control unit with outdoor reset function, modulating boiler water temperature, and load-dependent sequential control – two-stage or modulating burners are controlled.

Vitocrossal 300 is equipped with two return connections. The heating circuits with the higher return temperature are connected to the upper return connection, and those with lower return temperatures to the lower return plug.

Please note:
Connect at least 15 % of the rated output to the lower return connection.

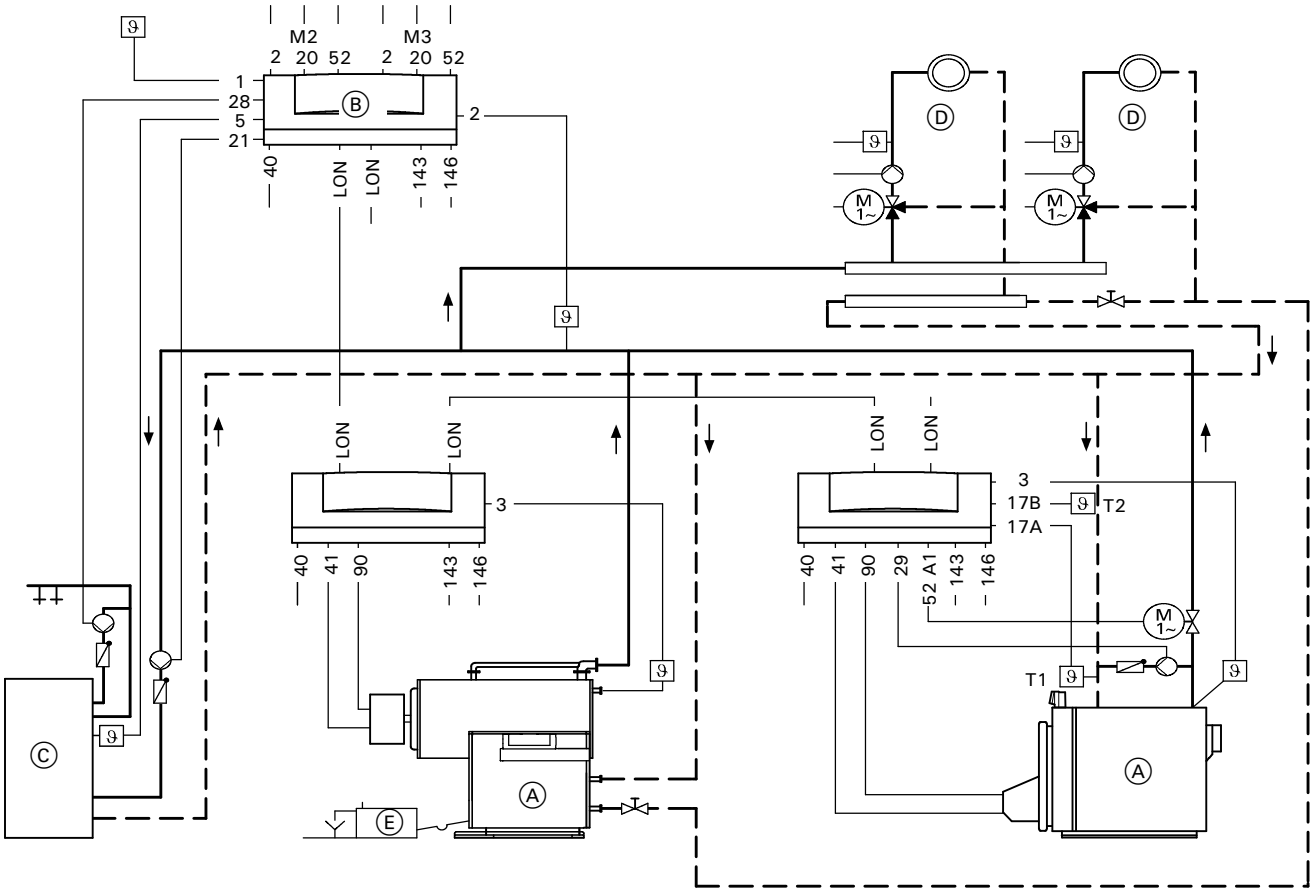
Due to the LON-BUS communication between controls, a boiler supply temperature is automatically set. This temperature is based on the highest required mixing valve circuit temperature plus adjustable differential.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 7

Heating circuit and one low temperature heating circuit plus Vitorond with shunt pump
Vitocrossal 300, CT3
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit
Ⓔ Neutralizing system

Plug

1		Outdoor temperature sensor
2		Supply temperature sensor common heating supply
2	M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
17	B	Temperature sensor T2
20	M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21		DHW pump
28		DHW recirculation pump
29		Shunt pump
40		Power supply, 120 VAC, 60 Hz
41		Burner (burner stage 1)
52	A1	Motorized isolation valve
52	M2/M3	Mixing valve actuator circuit 2 or 3
90		Burner (burner stage 2 / mod.)
143/146		External connections (see page 44)

System version 7 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Only with Vitotronic 100, GC1 for low temperature boiler: Oil fired operation (non-reversible)
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0d: 0	Only with Vitotronic 100, GC1 for Vitocrossal 300: Without Therm-Control
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A 1	Only with Vitotronic 100, GC1 for low temperature boiler: Connecting the T1 temperature sensor to plug 17 A
4b: 1	Only with Vitotronic 100, GC1 for low temperature boiler: Connecting the T2 temperature sensor to plug 17 B

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
39: 1 to 39: 4	Setting up Vitocrossal 300 as permanent lead boiler
3C: 1	Condensing strategy 1

*1 *If required.*

System version 7 *(continued)*

Possible applications
The Vitocrossal 300, CT3 (lead boiler) and the Vitorond 200, VD2 (lag boiler) are operated via a Viessmann control system with outoor reset logic, modulating boiler water temperature, and load-dependent sequential control – two-stage or modulating burners are controlled.

Vitocrossal 300, CT3 is equipped with two return connections. The heating circuits with the higher return temperature are connected to the upper return connection, and those with lower return temperatures to the lower return connection. Please note: Connect at least 15% of the rated output to the lower return connection. The return temperature control is available as accessory or must be provided on site.

Return temperature control for Vitorond can be achieved using the shunt pump and by closing the isolation valve.

Temperature sensor T1 controls the isolation valve. Temperature sensor T2 switches the shunt pump.

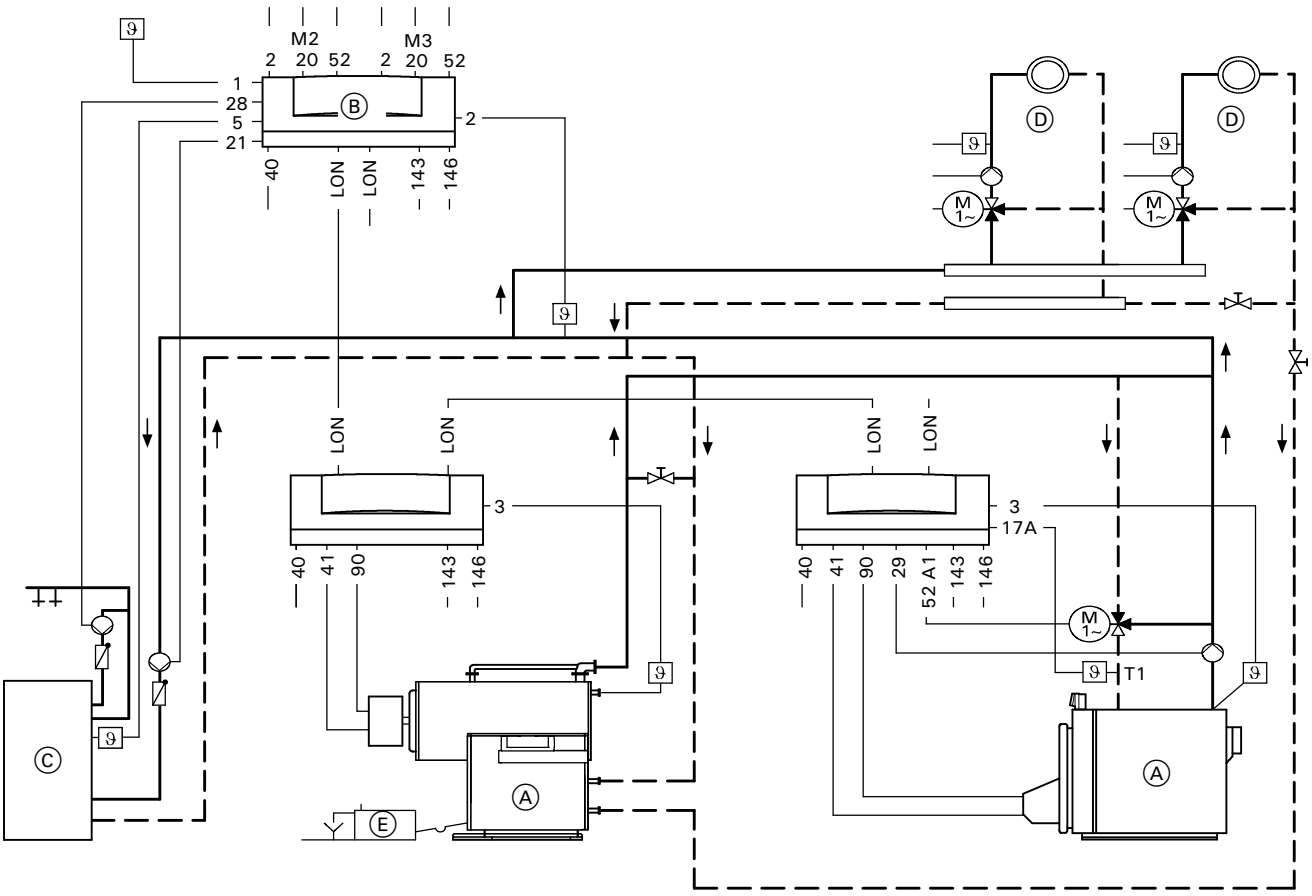
Due to the LON-BUS communication between controls, a boiler supply temperature is automatically set.
This temperature is based on the highest required mixing valve circuit temperature plus adjustable differential.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 8

Three-way mixing valve, several heating circuits and one low temperature heating circuit
Vitocrossal 300, CT3
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit
Ⓔ Neutralizing system

Plug

1	Outdoor temperature sensor
2	Supply temperature sensor common heating supply
2 M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3	Boiler temperature sensor
5	DHW tank temperature sensor
17 A	Temperature sensor T1
20 M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21	DHW pump
28	DHW recirculation pump
29	Boiler circuit pump
40	Power supply,120 VAC, 60 Hz
41	Burner (burner stage 1)
52 A1	Three-way mixing valve
52 M2/M3	Mixing valve actuator circuit 2 or 3
90	Burner (burner stage 2 / mod.)
143/146	External connections (see page 44)

System version 8 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03 : 1	Only with Vitotronic 100, GC1 for low temperature boiler: Oil fired operation (non-reversible)
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0C: 1	Only with Vitotronic 100, GC1 for low temperature boiler: Constant return temperature control
0d: 0	Only with Vitotronic 100, GC1 for Vitocrossal 300: Without Therm-Control
4d: 2	Only with Vitotronic 100, GC1 for low temperature boiler: Boiler circuit pump on plug 29
77 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A 1	Only with Vitotronic 100, GC1 for low temperature boiler: Connecting the T1 temperature sensor to plug 17 A

*1 If required.

System version 8 *(continued)*

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1[*1]
 35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
39: 1 to 39: 4	Setting up Vitocrossal 300 as permanent lead boiler
3b: 3	Autonomous series connection with supply temperature sensor

[*1] *If required.*

Possible applications
For heating circuits with temperature differentials ≥20°C / 68°F

The Vitocrossal 300, CT3 (lead boiler) and the next Vitorond (lag boiler) are operated via a Viessmann control system with outdoor reset logic, modulating boiler water temperature, and load-dependent sequential control – two-stage or modulating burners are controlled.

Vitocrossal 300, CT3 is equipped with two return connections. The heating circuits with the higher return temperature are connected to the upper return connection, and those with lower return temperatures to the lower return connection.

Please note: Connect at least 15% of the rated output to the lower return connection.

Temperature sensor T1 senses the return temperature.
The boiler control unit regulates the three-way mixing valve to ensure that the system never falls below the minimum return temperature.

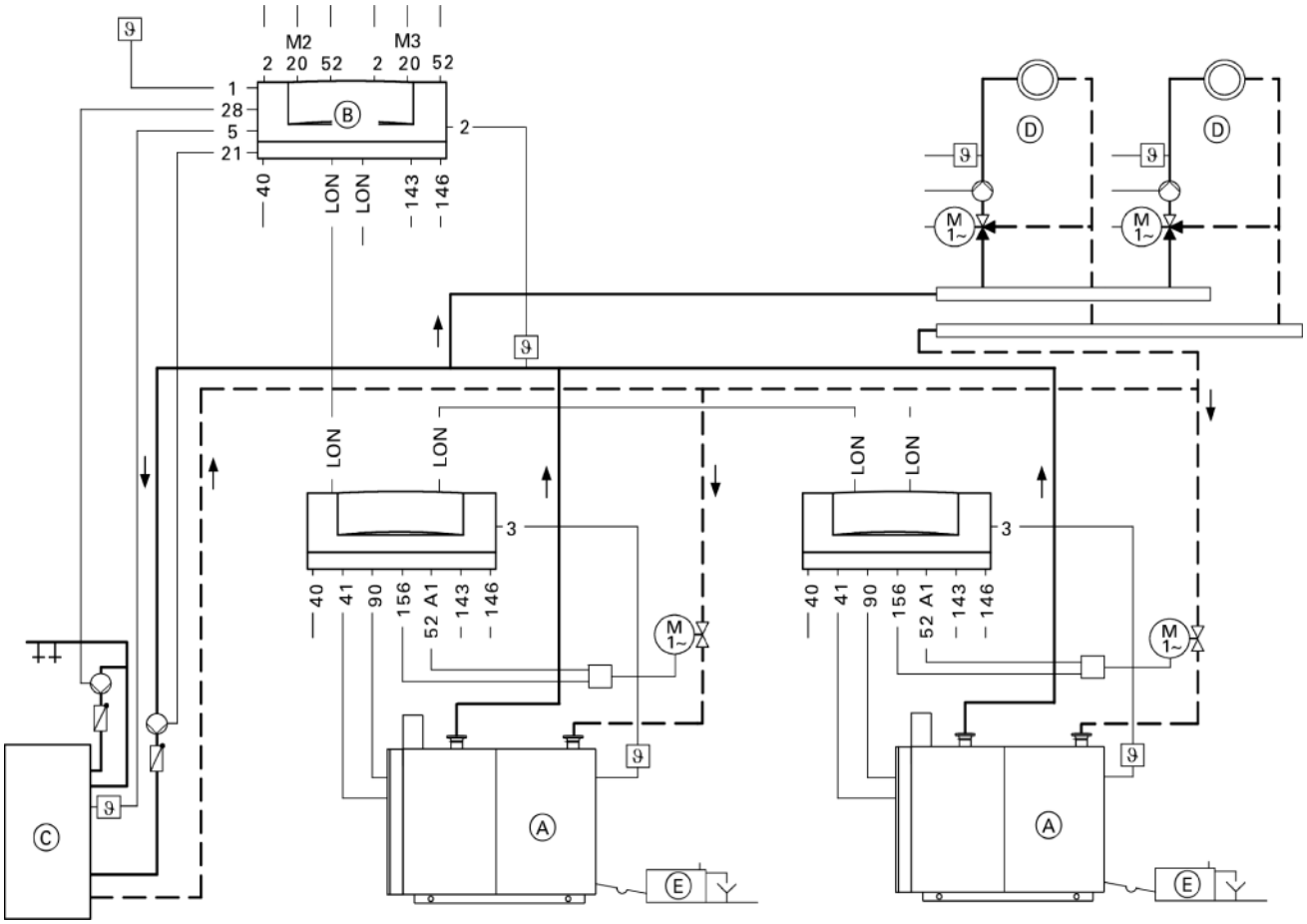
Due to the LON-BUS communication between controls, a boiler supply temperature is automatically set.
This temperature is based on the highest required mixing valve circuit temperature plus adjustable differential.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 9

Heating circuit and one low temperature heating circuit
Vitocrossal 200, CM2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit
Ⓔ Neutralizing system

Plug

1	Outdoor temperature sensor
2	Supply temperature sensor common heating supply
2 M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3	Boiler temperature sensor
5	DHW tank temperature sensor
90	Burner (burner stage 2 / mod.)
20 M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21	DHW pump
28	DHW recirculation pump
40	Power supply, 120 VAC 60 Hz
41	Burner (burner stage 1)
52 A1	Motorized isolation valve
52 M2/M3	Mixing valve actuator circuit 2 or 3
143/146	External connections (see page 44)

System version 9 *(continued)*

Codings must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0d: 0	Without Therm-Control
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
3C: 0	Condensing strategy

*1 *If required.*

System version 9 *(continued)*

Possible applications
Vitocrossal 200 is operated via a Viessmann boiler control unit with outdoor reset function, modulating boiler water temperature, and load-dependent sequential control – two-stage or modulating burners are controlled.

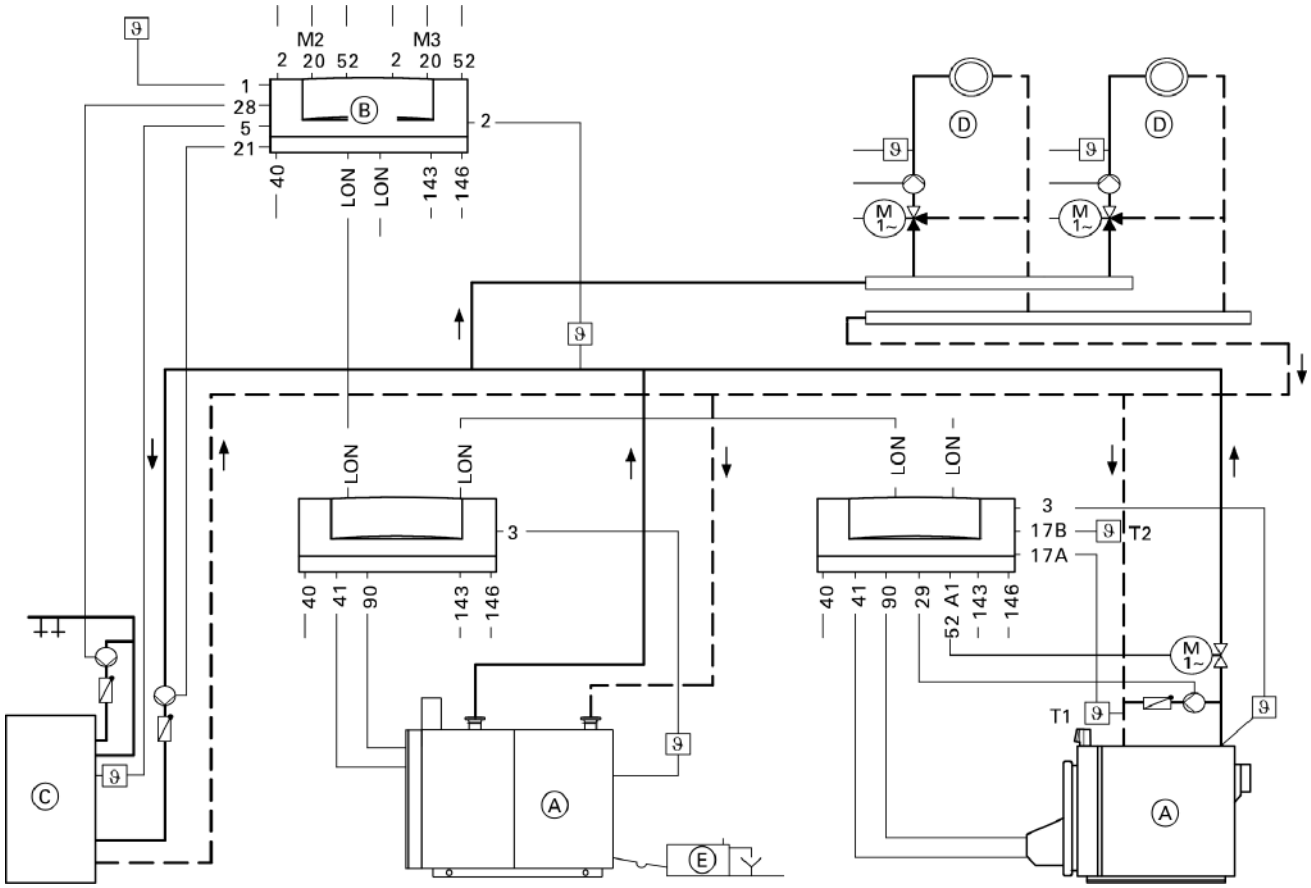
Due to the LON-BUS communication between controls, a boiler supply temperature is automatically set. This temperature is based on the highest required mixing valve circuit temperature plus adjustable differential.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

System version 10

Heating circuit and one low temperature heating circuit plus Vitorond with shunt pump
Vitocrossal 200, CM2
Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 100, GC1
Ⓑ Vitocontrol-S, VD2/CT3/CM2
Ⓒ DHW tank
Ⓓ Mixing valve circuit
Ⓔ Neutralizing system

Plug

1		Outdoor temperature sensor
2		Supply temperature sensor common heating supply
2	M2/M3	Supply temperature sensor mixing valve circuit 2 or 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
17	B	Temperature sensor T2
20	M2/M3	Heating circuit pump mixing valve circuit 2 or 3
21		DHW pump
28		DHW recirculation pump
29		Shunt pump
40		Power supply, 120 VAC, 60 Hz
41		Burner (burner stage 1)
52	A1	Motorized isolation valve
52	M2/M3	Mixing valve actuator circuit 2 or 3
90		Burner (burner stage 2 / mod.)
143/146		External connections (see page 44)

System version 10 *(continued)*

Coding must be set on **every** Vitotronic 100, GC1.

Vitotronic 100, GC1

Required coding	
01: 2	Multi-boiler system with cascade control via LON BUS
02: 2	Modulating burner operation*1
03: 1	Only with Vitotronic 100, GC1 for low temperature boiler: Oil fired operation (non-reversible)
07: 2 07: 3 07: 4	Setting the boiler number on the Vitotronic of boiler 2 boiler 3 boiler 4
0d: 0	Only with Vitotronic 100, GC1 for Vitocrossal 200: Without Therm-Control
77: 2 77: 3 77: 4	Setting the LON participant number on the Vitotronic of boiler 2 boiler 3 boiler 4
Automatic changeover	
4A 1	Only with Vitotronic 100, GC1 for low temperature boiler: Connecting the T1 temperature sensor to plug 17 A
4b: 1	Only with Vitotronic 100, GC1 for low temperature boiler: Connecting the T2 temperature sensor to plug 17 B

Vitocontrol-S, VD2/CT3/CM2

Required coding	
00: 3, 00: 4, 00: 7, or 00: 8	Without system circuit A1*1
35: 1 35: 2 35: 3	Vitocontrol-S, VD2/CT3/CM2 with one Vitotronic 100, GC1 two Vitotronic 100, GC1 three Vitotronic 100, GC1
39: 1 to 39: 4	Setting up Vitocrossal 200 as permanent lead boiler
3C: 1	Condensing strategy 1

*1 *If required.*

System version 10 *(continued)*

Possible applications
The Vitocrossal 200, CM2 (lead boiler) and the Vitorond 200, VD2 (lag boiler) are operated via a Viessmann control system with outoor reset logic, modulating boiler water temperature, and load-dependent sequential control – two-stage or modulating burners are controlled.

Return temperature control for Vitorond can be achieved using the shunt pump and by closing the isolation valve.

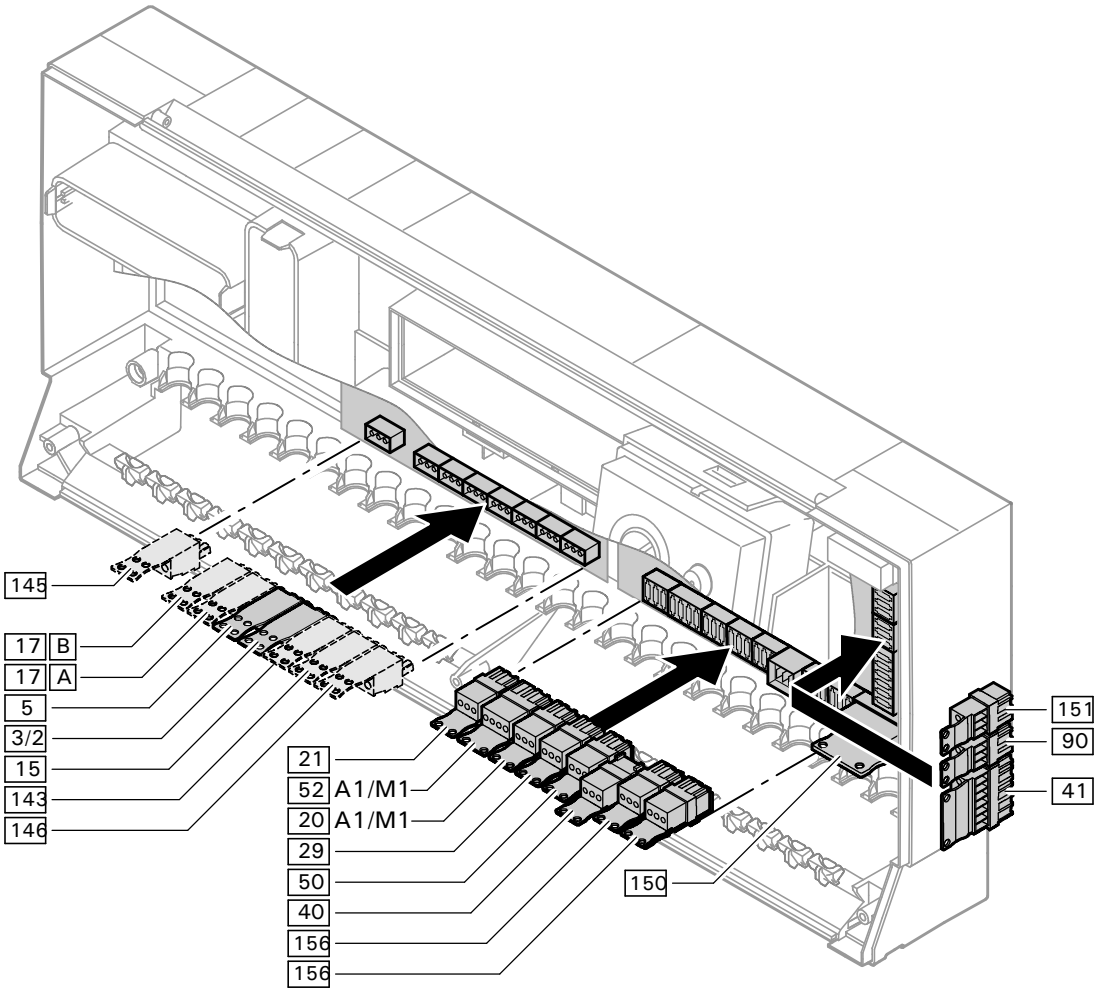
Temperature sensor T1 controls the isolation valve. Temperature sensor T2 switches the shunt pump.

Due to the LON-BUS communication between controls, a boiler supply temperature is automatically set.
This temperature is based on the highest required mixing valve circuit temperature plus adjustable differential.

IMPORTANT

The connection diagram is only a recommendation and needs to be verified for completeness and functionality at the installation site. Single-phase and three-phase pumps must be connected with field supplied motor contactors and/or motor starters.

Summary of electrical connections



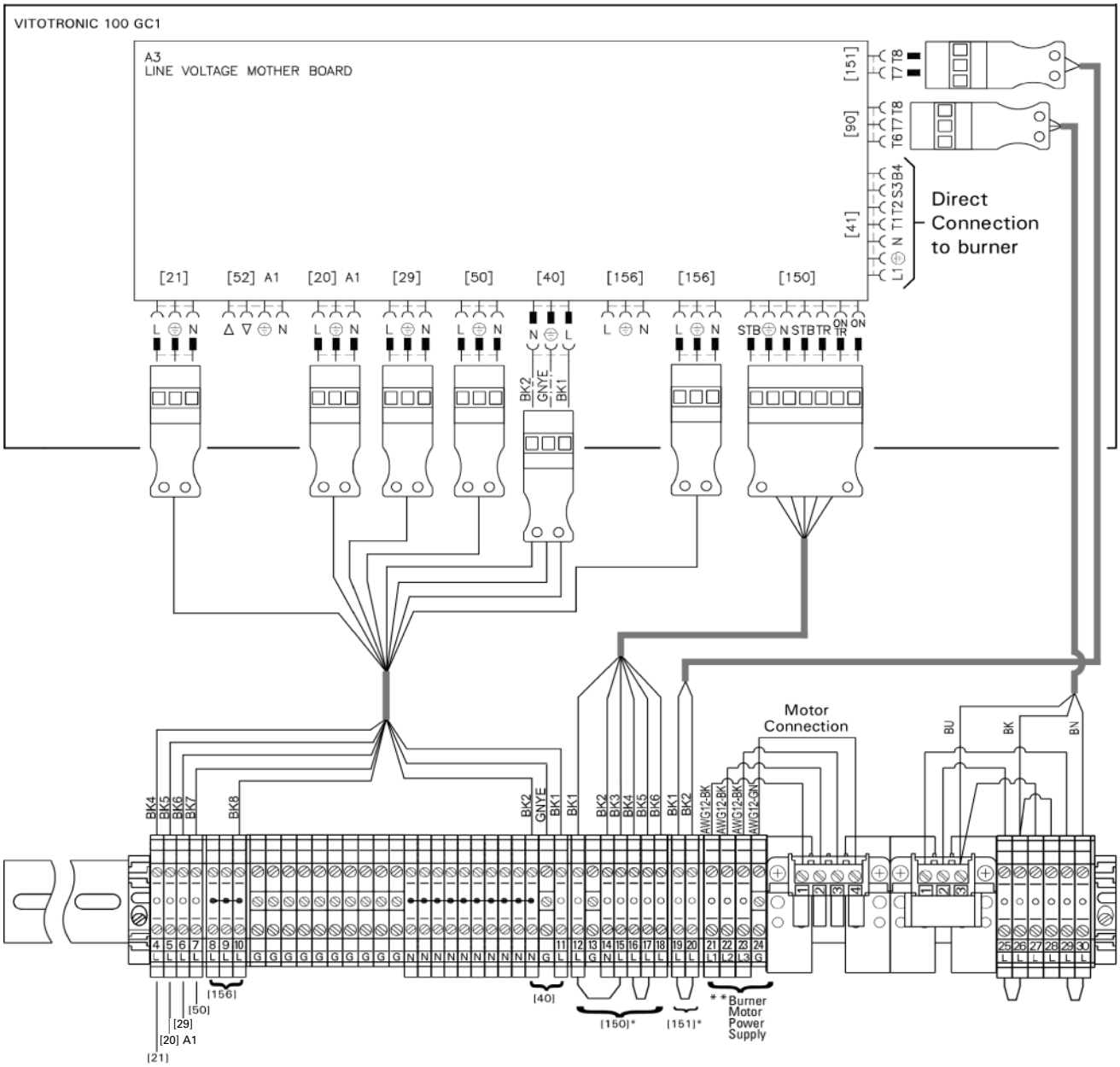
Low voltage connections (motherboard)

- 3 Boiler temperature sensor
- 5 No function
- 15 Flue gas temperature sensor (accessory)
- 17 A Therm-Control temperature sensor
  or
  return temperature sensor T1 (accessory)
- 17 B Return temperature sensor T2 (accessory)
- 143 External connection
- 145 KM BUS participant, e.g. plug-in adaptor for external safety equipment
- 146 External connection

Line voltage connections (motherboard)

- 20 A1 Switched output
- 21 No function
- 29 Shunt pump (on site)
  or
  boiler circuit pump (on site)
- 40 Power connection
- 41 Burner (burner stage 1)
- 50 Central fault message
- 52 A1 Isolation valve
  or
  actuator for three-way mixing valve for return temperature control
- 90 Burner (burner stage 2 / mod.)
- 150 External connections, e.g. supplementary safety equipment
- 151 Safety circuit, potential free
- 156 Power supply for accessories

Overview of Electrical Connections (VD2/VD2A/CT3 only) (*continued*)

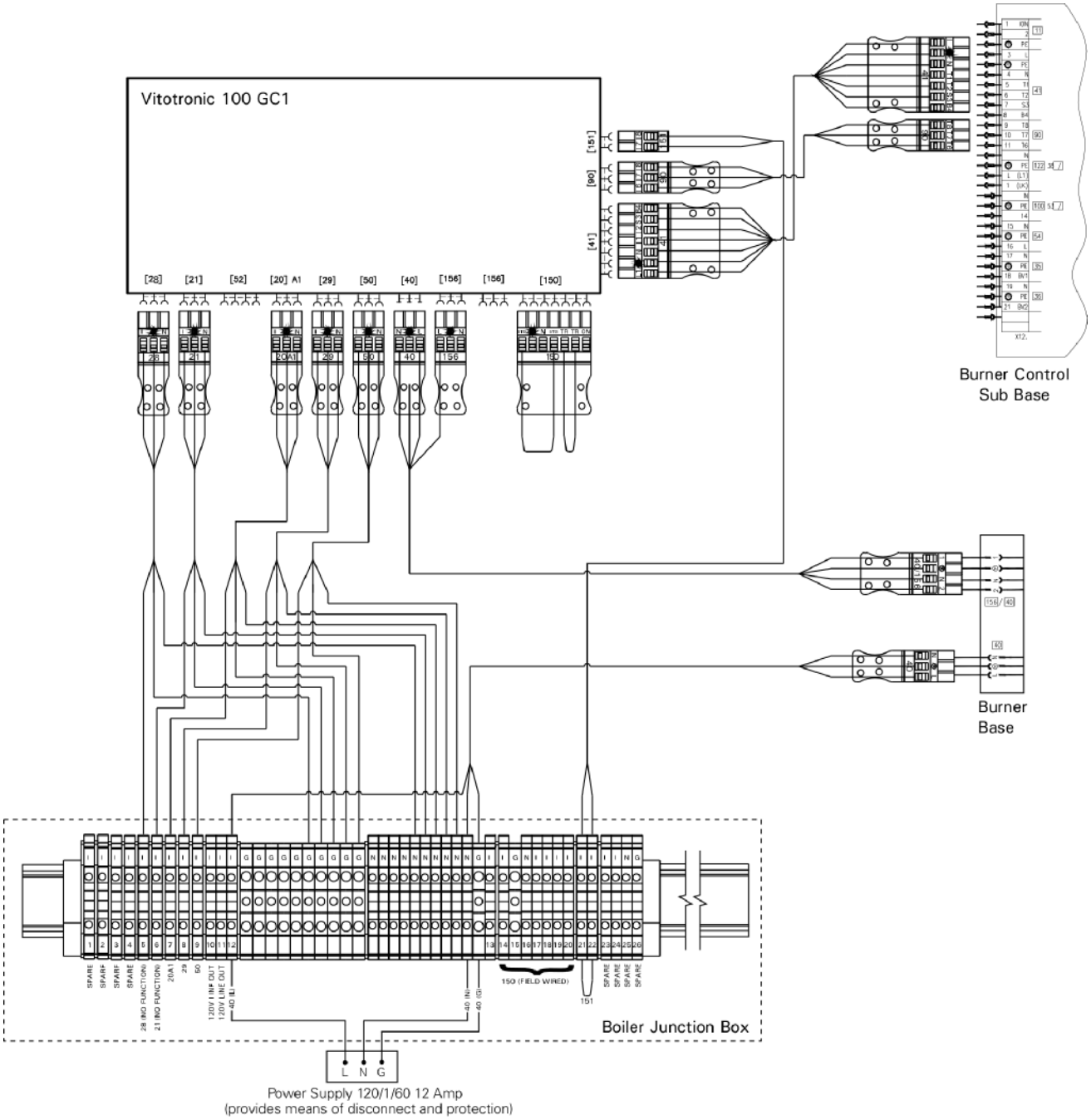


External line voltage connections

* Remove jumper when making connection

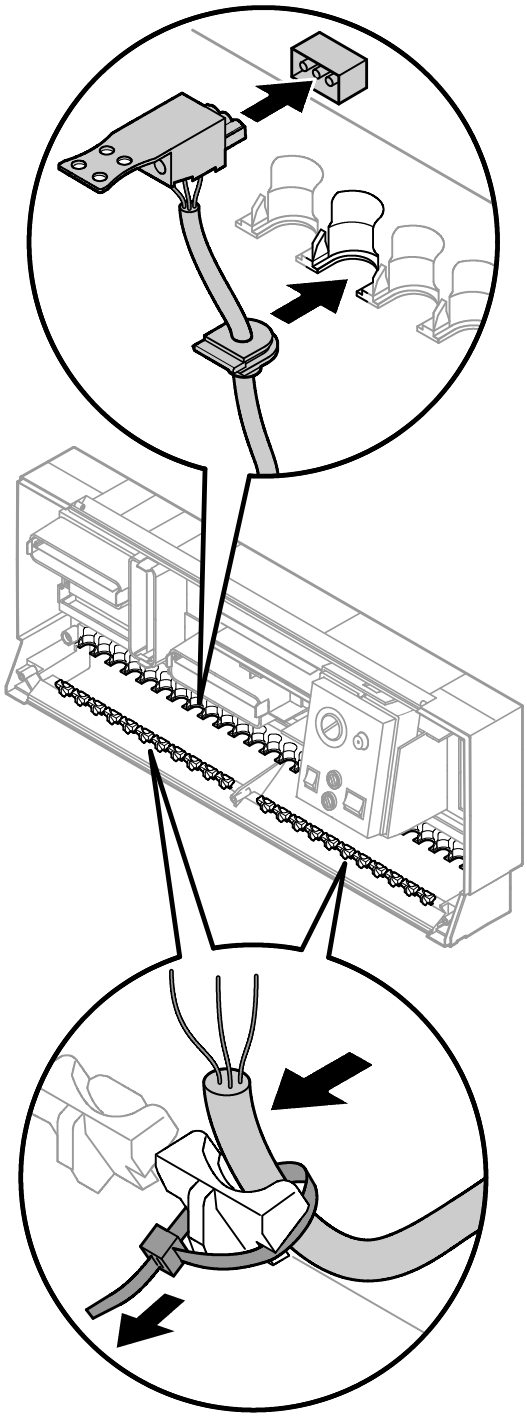
** Single phase or 3 phase burner motor power connection (3 phase shown)

Overview of Electrical Connections (CM2 only) (*continued*)



Inserting cables and applying strain relief

Run the cables from the connection enclosure into the control unit.
Apply strain relief to cables (see below).



Cables with moulded strain relief clamp

Connect cable and strain relief clamp.

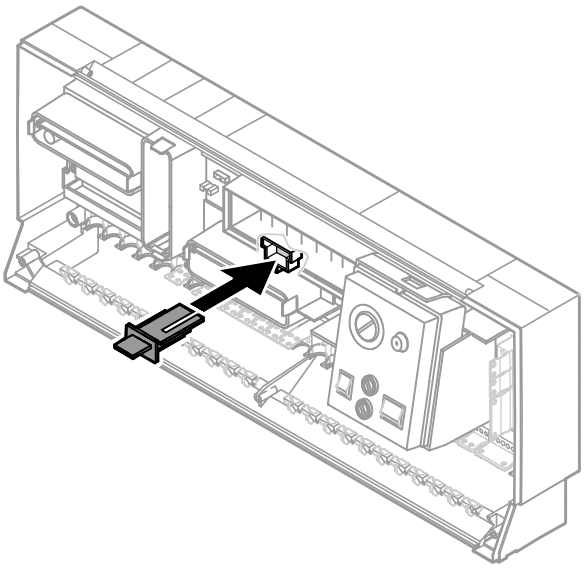
OR

Fasten cable to the cable lead with cable tie.

Inserting the boiler coding card

Only use the boiler coding card included with the boiler.

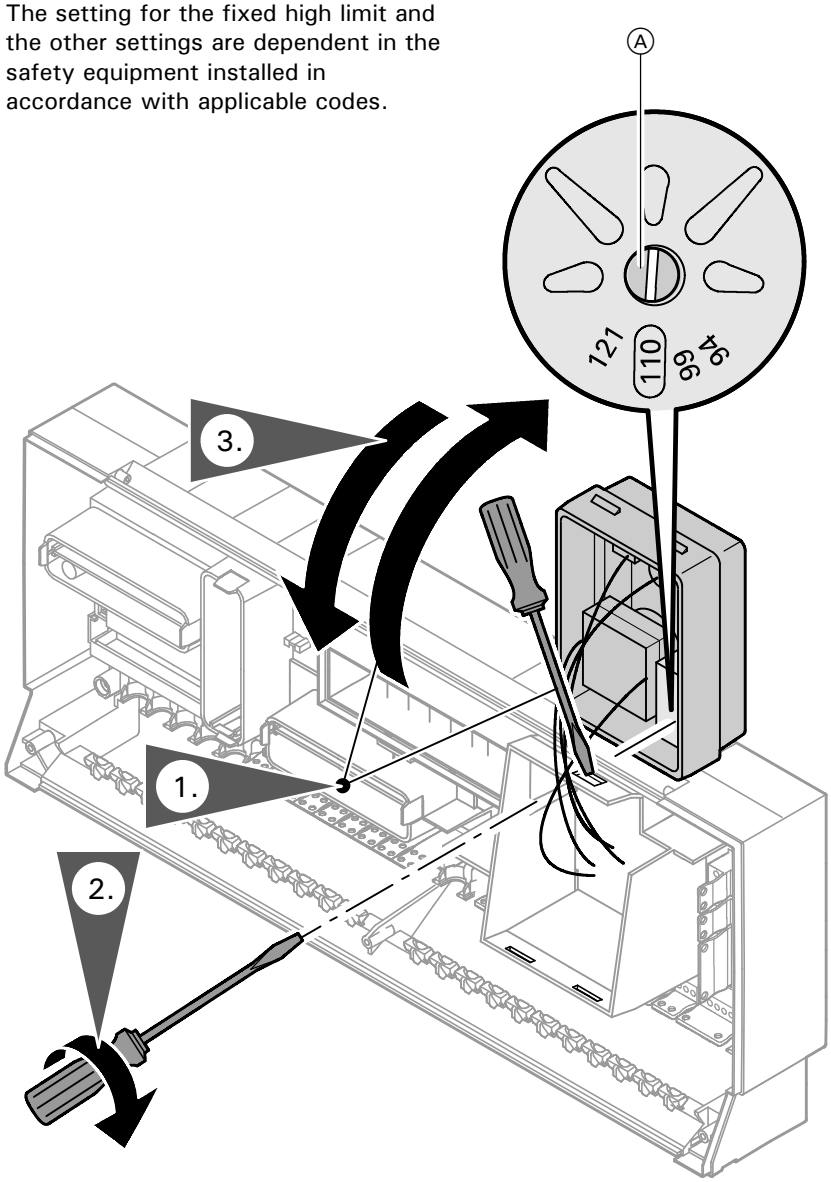
Boiler	Coding card	Part no.
Vitocrossal 300, type CT3	1040	7820 144
Vitorond 200, VD2 / VD2A	1020	7820 142
Vitocrossal 200, CM2	1041	7820 145



Insert the boiler coding card through the cut-out in the cover into slot X7.

Setting of the fixed high limit (if required)

Settings on the control unit
The setting for the fixed high limit and the other settings are dependent in the safety equipment installed in accordance with applicable codes.



The fixed high limit is supplied with a factory setting of 110°C / 230°F.

- On Vitotronic 100, GC1 for Vitorond 200, VD2 of 110°C / 230°F

  Adjustment to 99°C / 210°F

- On Vitotronic 100, GC1 for Vitocrossal 300, CT3 of 99°C / 210°F
  - No adjustment

⚠ **Disconnect power to control and burner!**

1. Unclip the fuse box and swing upwards.

2. Turn the slotted screw on the rear of the fixed high limit until the slot points to 99°C / 210°F (once adjusted, the fixed high limit **cannot** be reset to 110°C / 230°F).

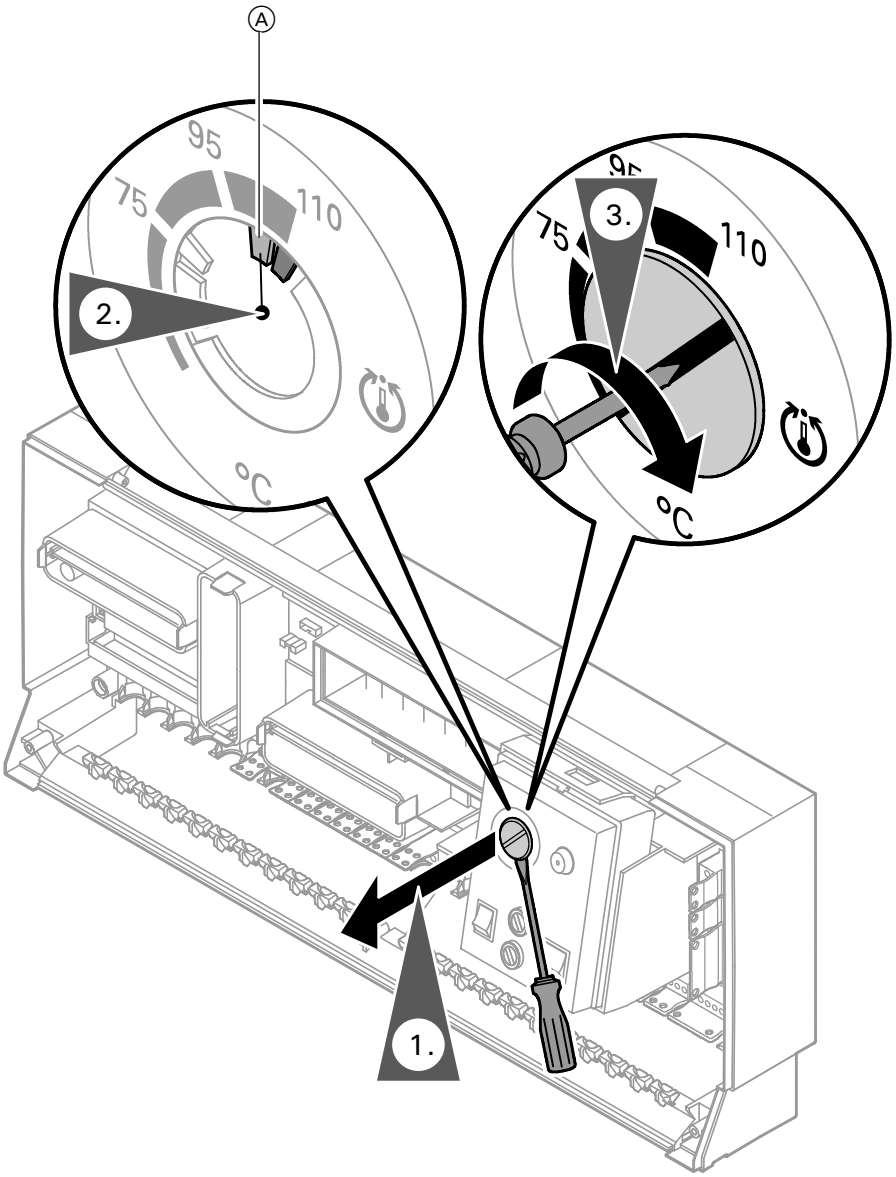
3. Re-fit the fuse box.

⚠ WARNING

If adjusted to 99°C / 210°F, do not set the adjustable high limit above 75°C / 167°F.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Setting of the Adjustable High Limit (if required)



The adjustable high limit is supplied with a factory setting of 95°C / 203°F
Adjustment to 100°C / 212°F

1. Disconnect power to control and burner.

2. Using a suitable screwdriver, lever out and remove the selector knob "⏱" behind the hinged cover.

3. Using a pair of pointed pliers, break off the cams identified by the shaded areas in the Fig. from the stop dial.

Ⓐ	75 to 100°C 167 to 212°F

4. Fit the selector knob "⏱" so that the marking is in the centre of the selected range.

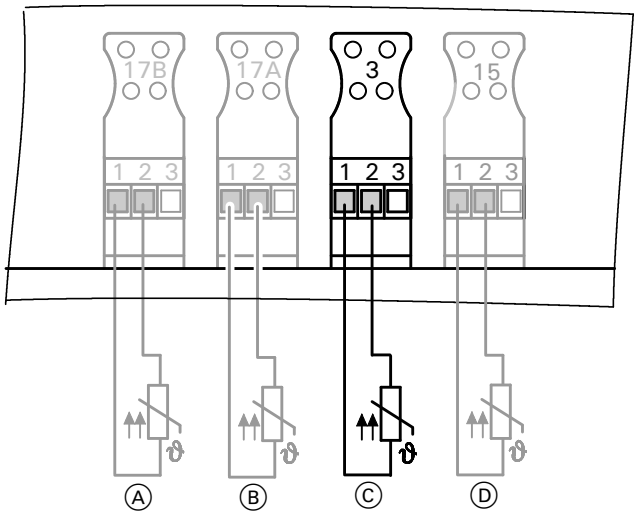
IMPORTANT

Note the setting of coding address "06"!

⚠ WARNING

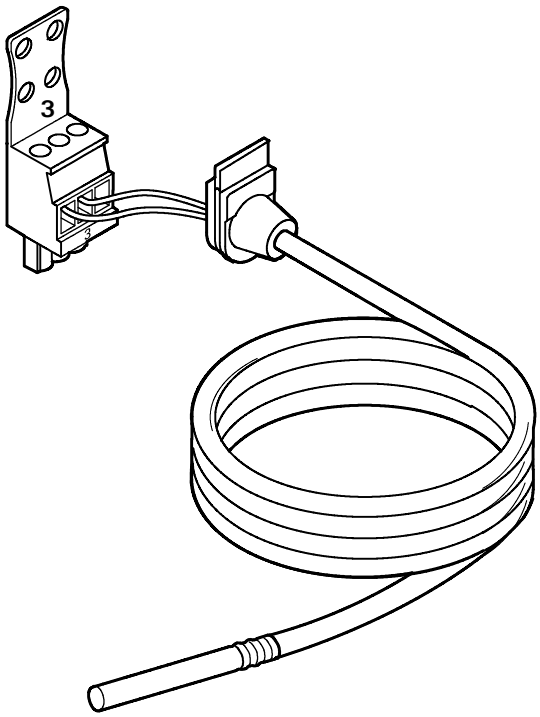
If the system is operated in conjunction with a domestic hot water tank, ensure that the maximum permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.

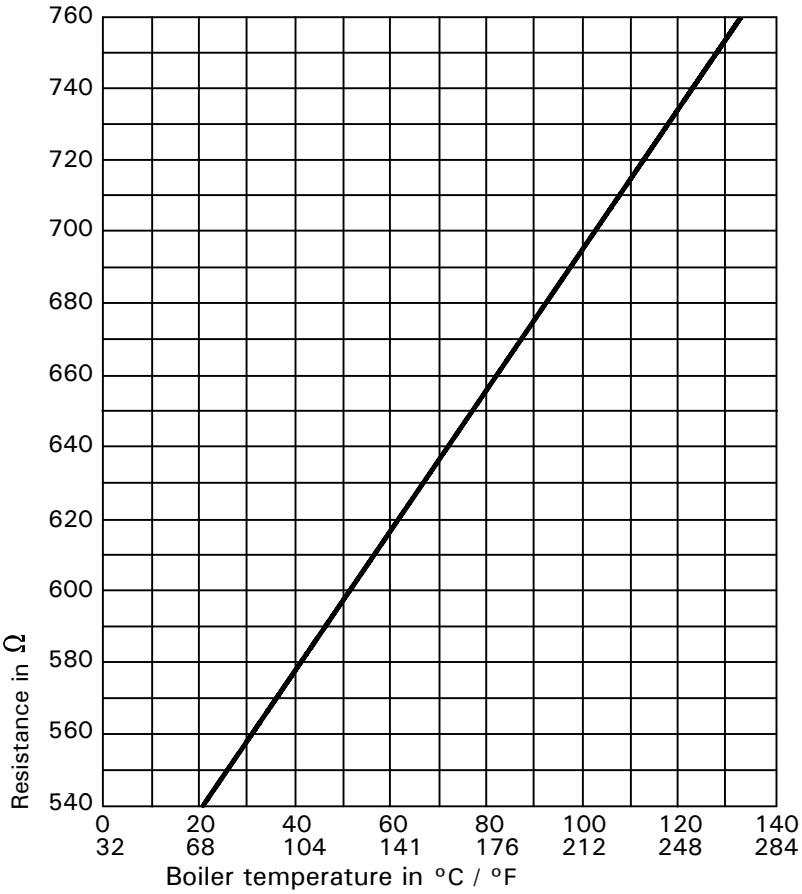
Sensor connection



Ⓐ Temperature sensor T2
Ⓑ Temperature sensor T1
Ⓒ Boiler temperature sensor
Ⓓ Flue gas temperature sensor

Connection of the boiler temperature sensor





The sensor measures the boiler water temperature of the boiler.

The boiler temperature sensor is installed at the same time as the boiler insulation.

Check the sensor

1. Disconnect plug 3 in the terminal compartment of the boiler control.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Boiler water temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

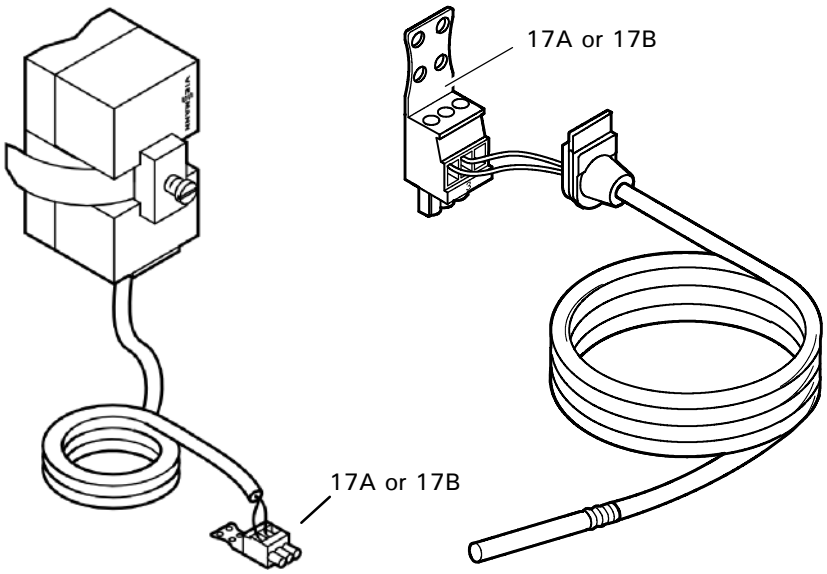
Degree of protection: IP 32
Ambient temperature
- during operation:
  0 to + 130°C
  32 to + 266°F
- during storage and transport:
  -20 to + 70°C
  - 4 to + 158°F

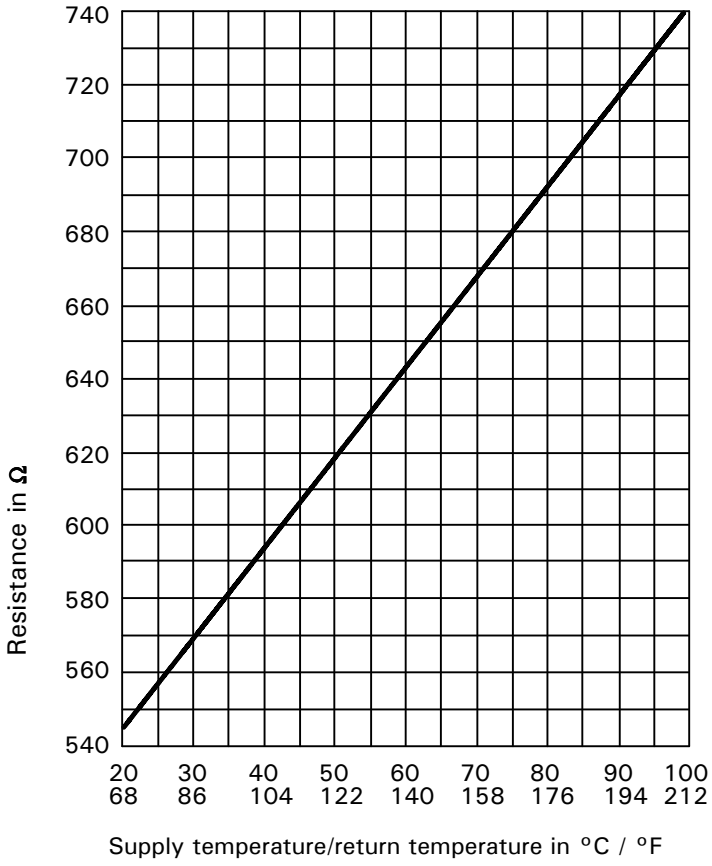
Electrical connection

The sensors are ready to plug in. Insert the boiler temperature sensor in socket "3" of the boiler control.

Connection of the return temperature sensor

Strap-on temperature sensor and immersion temperature sensor





For measuring the supply and return temperature.

Electrical connection
The sensor is inserted in socket "17A" or "17B" on the control unit.

Check the sensor

1. Disconnect plug 17 A or 17 B in the terminal compartment.
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

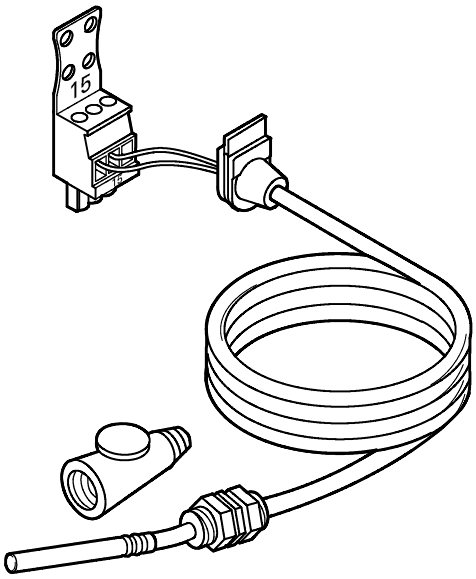
Flow/return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

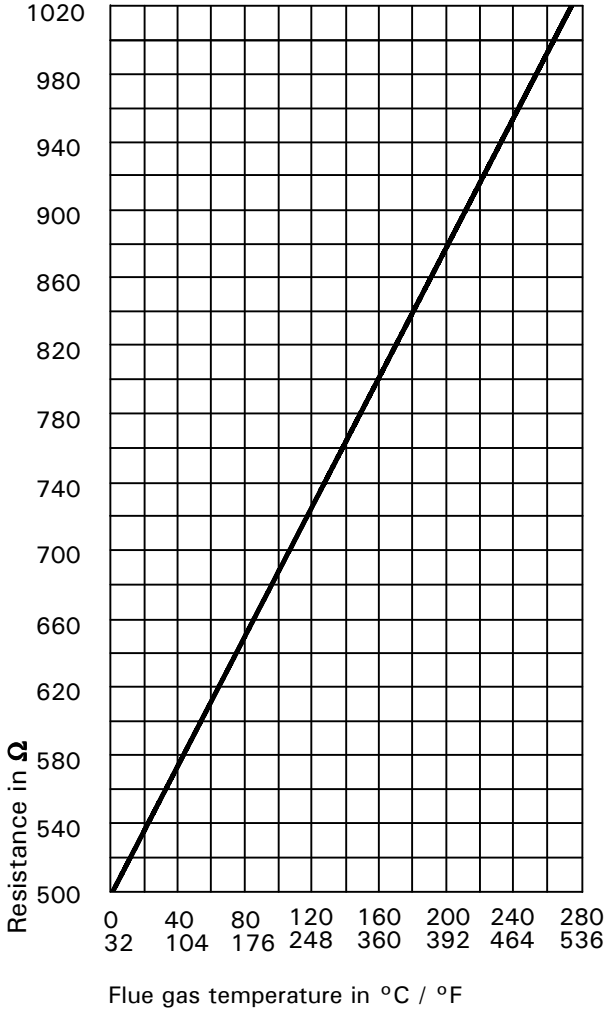
3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- during operation:
  0 to + 100°C
  32 to + 212°F
- during storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

5351 340 v1.4

Connection of the flue gas temperature sensor (VD2/VD2A/CT3 only)





The sensor measures the flue gas temperature and monitors the selected limit value.

Electrical connection
The sensor is inserted in socket "15" on the control unit.

Check flue gas temperature sensor

1. Disconnect plug 15 in the terminal compartment.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

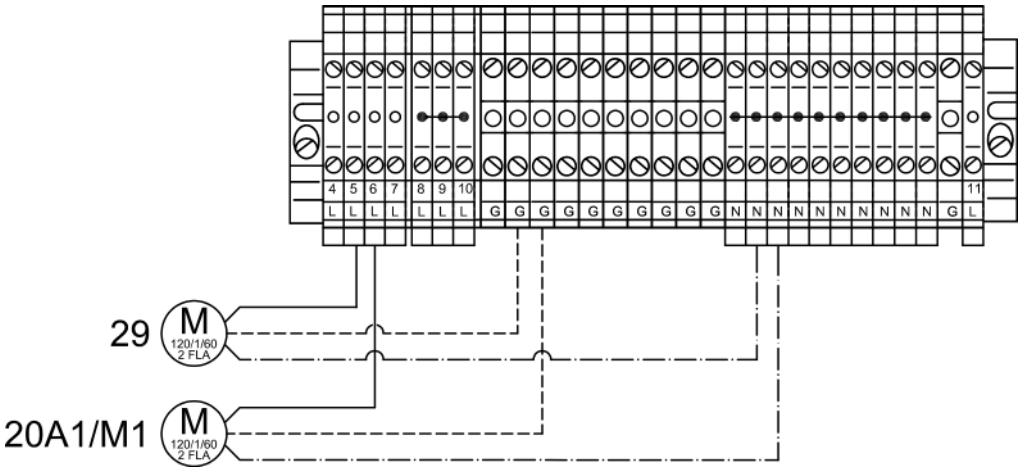
Flue gas temperature in °C / °F	Resistance in Ω
80 / 176	650
160 / 320	800
200 / 392	880

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 60
Ambient temperature
- during operation:
  0 to + 600°C
  32 to + 1112°F
- during storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

Connection of the Pumps (VD2/VD2A/CT3 only)

Available pump connections



20 Switched contact
Terminals 5 - L, - G , - N

29 Shunt pump, boiler circuit pump
Terminals 6 - L, - G, - N.

Install pumps: see manufacturer's instructions.

120 VAC pumps

Note:
The maximum power consumption of all pumps is 4A .
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

Use contactor for pumps with higher current rating

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:
Use contactor and/or motor starter to power pump.
For activating the contactor:
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

Please ensure that all connections and wire sizes comply with local and national codes.

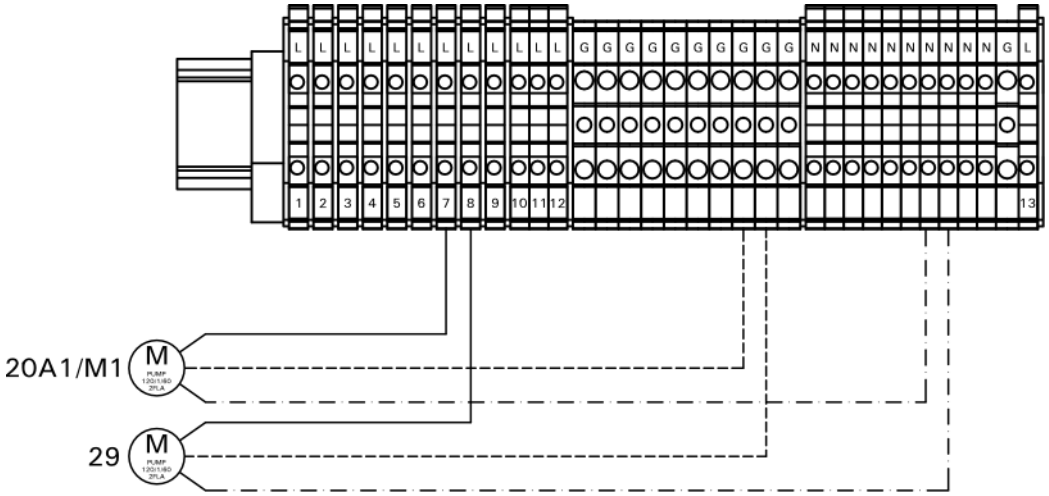
1. Select the contactor and the connecting wire in accordance with the rating of the pump that is to be connected.

2. Connect pump and power supply to the contactor.

3. Connect contactor coil to the corresponding terminals.

Connection of the Pumps (CM2 only)

Available pump connections



20 Switched contact
Terminals 7 - L, - G , - N

29 Shunt pump, boiler circuit pump
Terminals 8 - L, - G, - N.

Install pumps: see manufacturer's instructions.

120 VAC pumps

Note:
The maximum power consumption of all pumps is 4A .
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

Use contactor for pumps with higher current rating

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:
Use contactor and/or motor starter to power pump.
For activating the contactor:
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

Please ensure that all connections and wire sizes comply with local and national codes.

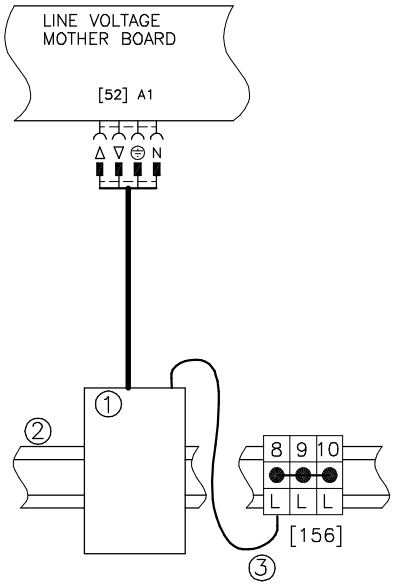
1. Select the contactor and the connecting wire in accordance with the rating of the pump that is to be connected.

2. Connect pump and power supply to the contactor.

3. Connect contactor coil to the corresponding terminals.

Connection of Boiler Return Mixing Valve or Isolation/Modulating Valve actuator

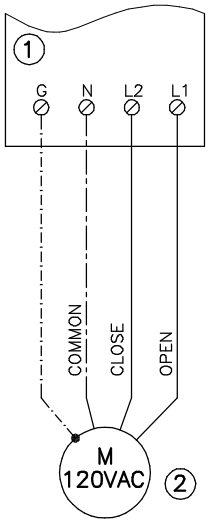
(VD2/VD2A/CT3 only)



① 120V or 24V Valve Adaptor

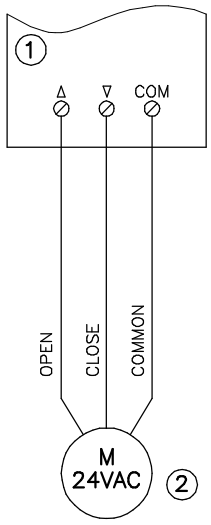
② DIN rail in connection enclosure

③ [156] Terminals



① 120V Valve Adaptor

② 120V valve actuator



① 24V Valve Adaptor

② 24V valve actuator

120V Valve Adaptor
Rated voltage: 120 VAC
Rated current: max. 0.1 FLA
Recommended connection
wire size: AWG 14
Part No. 7134 560

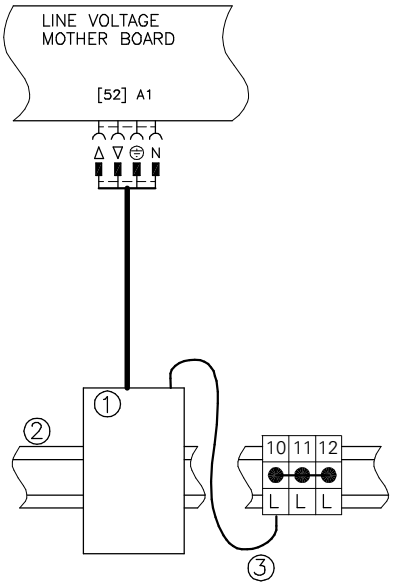
24V Valve Adaptor
Rated voltage: 24 VAC
Rated current: max. 0.15 FLA
Recommended connection
wire size: AWG 14
Part No. 7134 559

Operating time:
5 to 199 sec. selected via coding address “40”.

1. Disconnect power to control.
2. Install 120V or 24V Valve Adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie (see page.45).
5. Connect black wire of the adaptor to connection [156] on the DIN rail
   - Terminal 8,9 or 10.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Connection of Boiler Return Mixing Valve or Isolation/Modulating Valve actuator

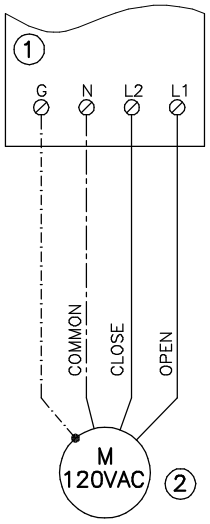
(CM2 only)



① 120V or 24V Valve Adaptor

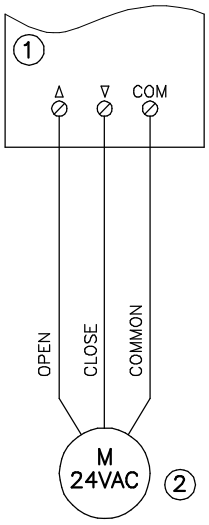
② Junction box

③ 120V L out power supply



① 120V Valve Adaptor

② 120V valve actuator



① 24V Valve Adaptor

② 24V valve actuator

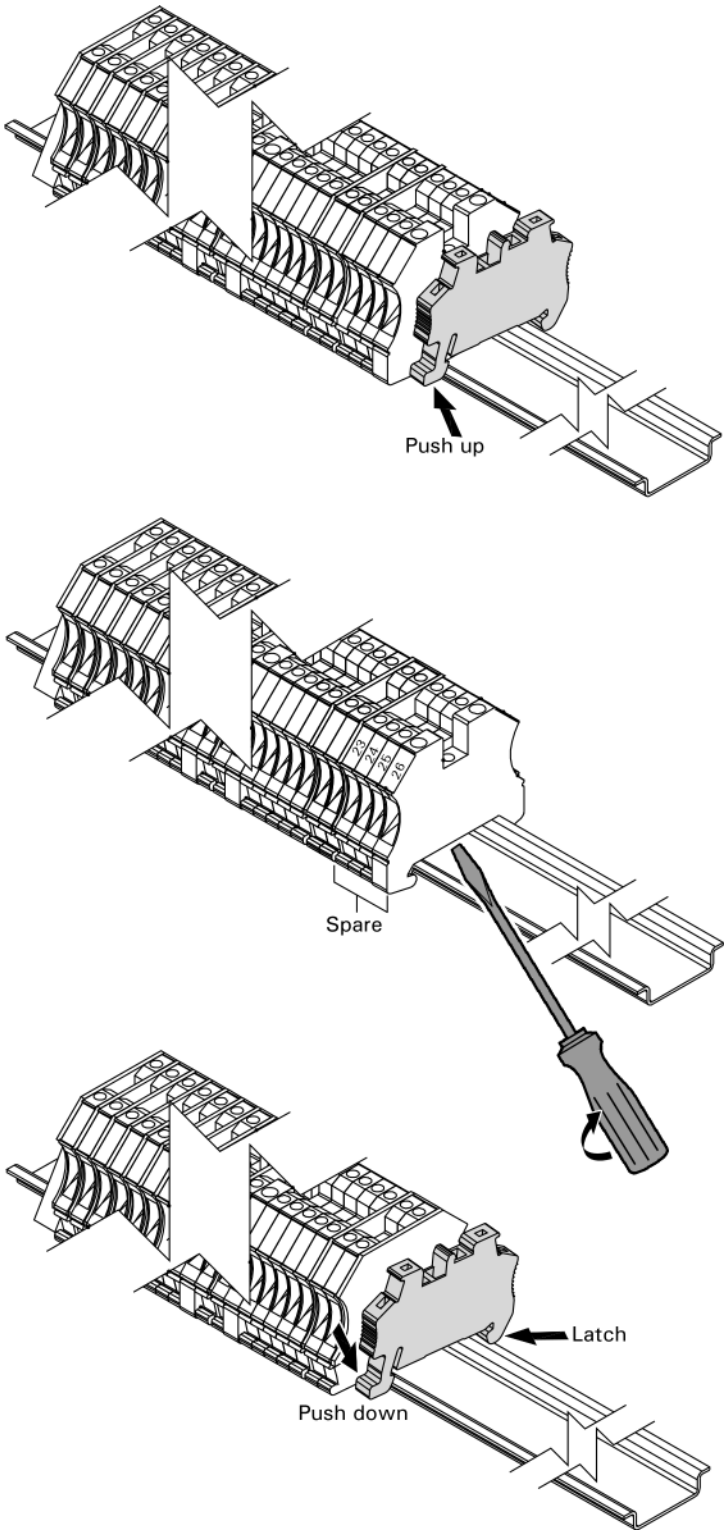
120V Valve Adaptor
Rated voltage: 120 VAC
Rated current: max. 0.1 FLA
Recommended connection
wire size: AWG 14
Part No. 7511367

24V Valve Adaptor
Rated voltage: 24 VAC
Rated current: max. 0.15 FLA
Recommended connection
wire size: AWG 14
Part No. **7511366**

Operating time:
5 to 199 sec. selected via coding address “40”.

1. Disconnect power to control.
2. Install 120V or 24V Valve Adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie (see page.45).
5. Connect black wire of the adaptor to connection 120V L out the DIN rail
   - Terminals 10,11 or 12.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Making Space for Accessory Adaptors on the DIN Rail (CM2 only)



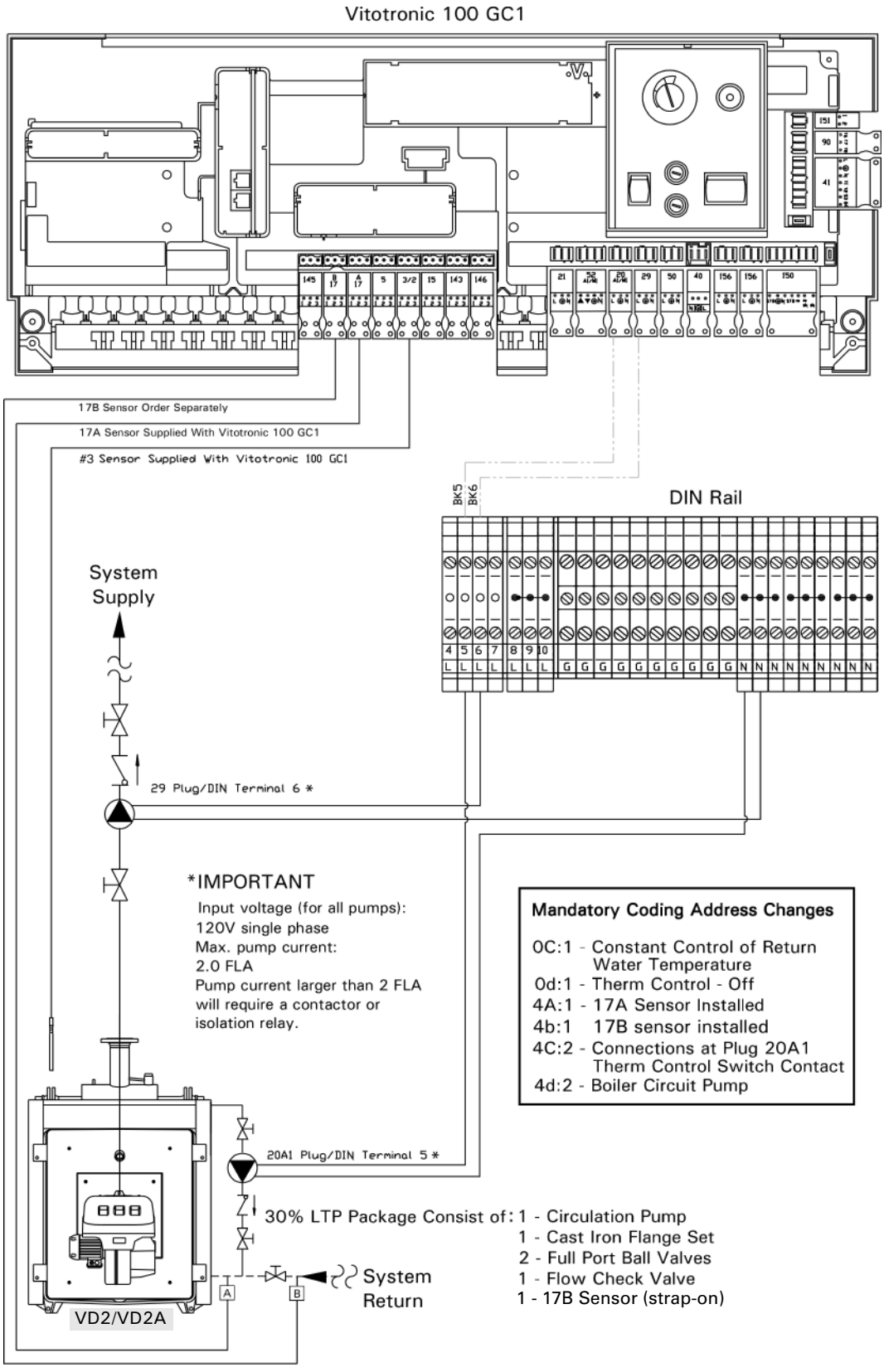
1. Push up on the bottom front of the DIN rail clamp to remove and set aside.

2. Using a flat head screwdriver, remove the 4 'spare' DIN terminals 23, 24, 25 and 26 one at a time. Place the screwdriver between the rail and the base of the terminal and turn the screwdriver clockwise . Discard the removed terminals.

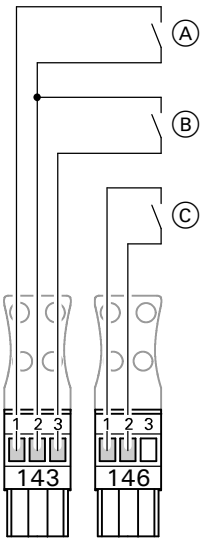
3. Re-install the DIN rail clamp by hooking the latch of the clamp around the top of the rail and then push down on the front of the clamp.

Note: See separate Installation Instructions for accessory adaptors.

Vitotronic 100, GC1 with 30% LTP Package (VD2/VD2A only)


Vitotronic 100 GC1
17B Sensor Order Separately
17A Sensor Supplied With Vitotronic 100 GC1
#3 Sensor Supplied With Vitotronic 100 GC1
BK5
BK6
DIN Rail
System Supply
29 Plug/DIN Terminal 6 *
*IMPORTANT
Input voltage (for all pumps):
120V single phase
Max. pump current:
2.0 FLA
Pump current larger than 2 FLA will require a contactor or isolation relay.
Mandatory Coding Address Changes
0C:1 - Constant Control of Return Water Temperature
0d:1 - Therm Control - Off
4A:1 - 17A Sensor Installed
4b:1 17B sensor installed
4C:2 - Connections at Plug 20A1 Therm Control Switch Contact
4d:2 - Boiler Circuit Pump
20A1 Plug/DIN Terminal 5 *
30% LTP Package Consist of: 1 - Circulation Pump
1 - Cast Iron Flange Set
2 - Full Port Ball Valves
1 - Flow Check Valve
1 - 17B Sensor (strap-on)
System Return
VD2/VD2A

Connection of external controls



Ⓐ Boiler disable

Ⓑ Activate boiler as last in the boiler sequence

Ⓒ External changeover between staged/modulating burner

Ⓐ

Boiler disable
Connect dry contact at terminals "1" and "2" of the plug [143].

Contact closed:
The boiler burner is disabled.
It is taken out of the boiler sequence, i.e. isolation valve/return valve are closed. The shunt pump/boiler circuit pump are switched off. The heat must be supplied by other boilers.

⚠ ***Safety instruction!***
If all boilers are disabled or no other boilers are ready for operation, there is ***no*** *frost protection of the heating sysytem.*

Contact open:
The boiler is put back in the current boiler sequence.

Ⓑ

Activate boiler as last in the boiler sequence.
Connect dry contact at terminals "2" and "3" of the plug [143].

The boiler is activated as last in the boiler sequence. The other boilers take over the supply of heat for the heating system. If the output of the other boilers is not sufficient, the boiler is activated.

Contact open:
The boiler is put back in the current boiler sequence.

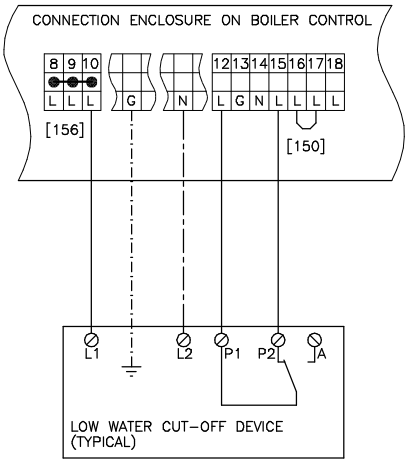
Ⓒ

External changeover between staged/modulating burner
Connect dry contact to terminals "1" and "2" of the plug [146].

Contact open: Modulating operation
Contact closed: Two-stage operation
The burner type must be set to modulating in coding 1 (coding "02: 2").

Please note:
When the burner type is scanned, "modulating" continues to be displayed after external changeover (the display in not changed).

Connection of Low Water Cut-off Device (VD2/VD2A/CT3 only)



156 Power supply for accessories.

150 Connection for external equipment.

1. Remove jumper between terminals 12 and 15.
2. Make connection as shown in diagram.

CAUTION

Please note that the diagram at left is only a simplified conceptual drawing of a typical low water cut-off (LWCO) device. Refer to the manual specific to the device for interconnection details.

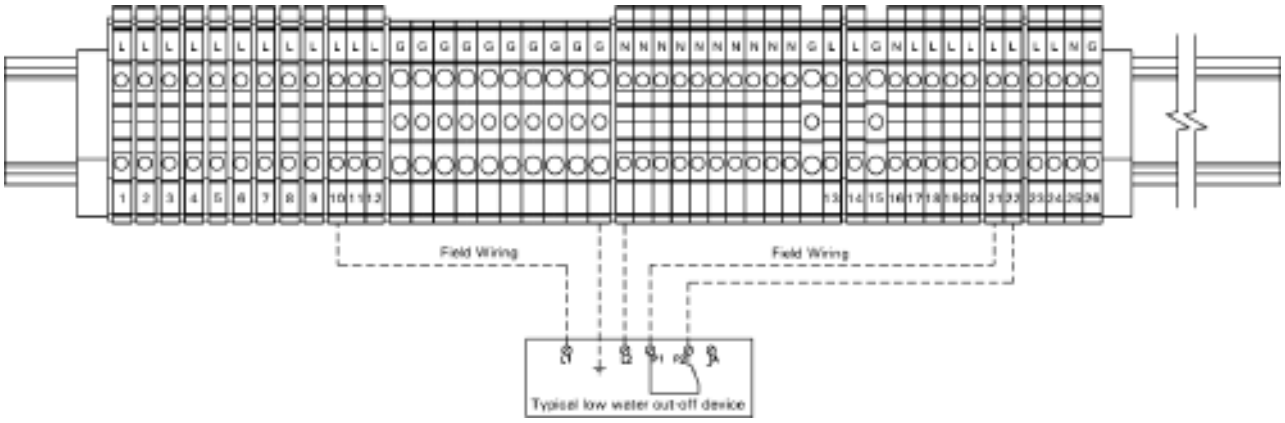
Connection of Low Water Cut-off Device (CM2 only)

1. Remove jumper between terminals 21 and 22.

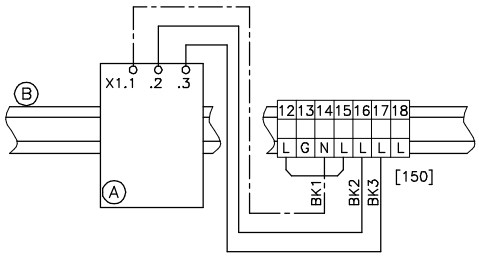
2. Make connection as shown in diagram.

⚠ CAUTION

Please note that the diagram shown is only a simplified conceptual drawing of a typical low water cut-off (LWCO) device. Refer to the manual specific to the device for interconnection details.



Connection of Combustion Air Device (VD2/VD2A/CT3 only)



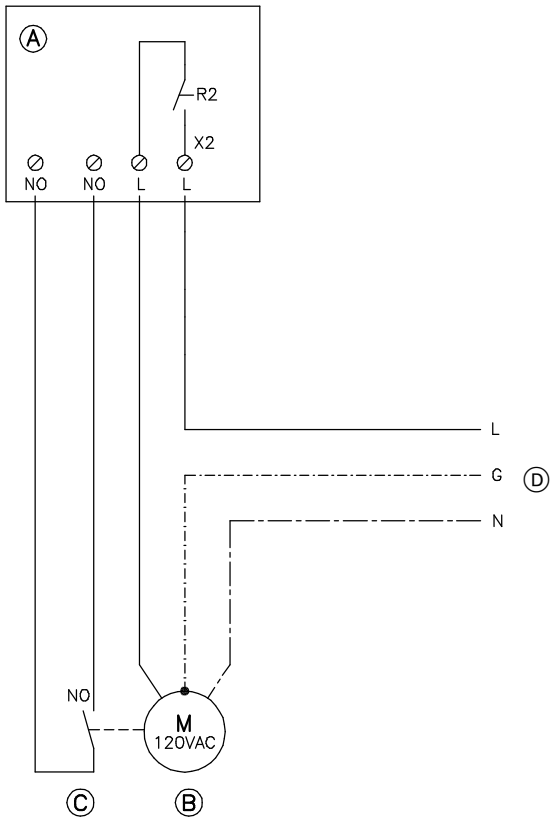
Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.
2. Install Combustion Air Device Adaptor,
   Part No. 7134 563
   on DIN Rail inside connection enclosure (refer to installation manual of Combustion Air Device Adaptor).
3. Remove jumper between terminals 16 and 17.
4. Make connection as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 16 and BK3 to terminal 17 - DO NOT reverse.

Ⓐ Combustion Air Device Adaptor
Ⓑ DIN Rail in connection enclosure



Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

Ensure that combustion air blower device is suitable for this application.

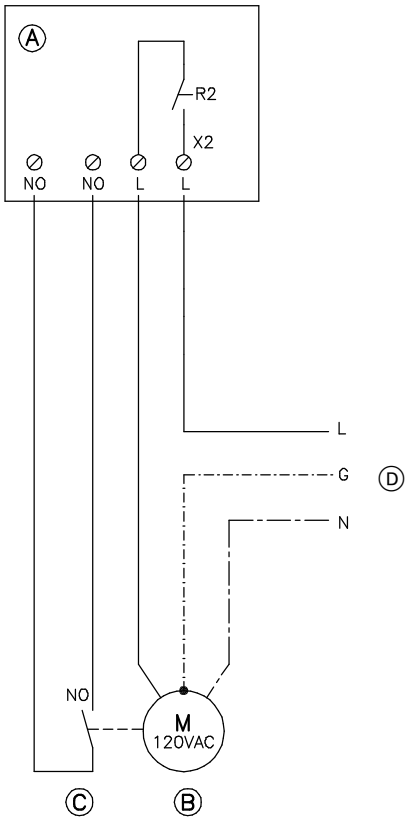
For detailed instruction on adaptor installation please refer to the adaptor's installation manual.

1. Make connection as shown in the diagram at left.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Combustion air blower motor
Ⓒ Proving switch - "normally open" rated for 120 VAC.
Ⓓ Power supply, 120 VAC

⚠ ***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.

Connection of Combustion Air Device (CM2 only)



Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.

2. Install Combustion Air Device Adaptor, Part No. 7134 563 on DIN Rail inside the boiler junction box (refer to installation manual of Combustion Air Device Adaptor).

3. Remove plug 150 from Vitotronic control. Remove jumper between the 2 'TR' terminals. Using 14 AWG (field supplied) connect plug terminals TR(Left), TR(Right) and neutral to the DIN rail.

Neutral to Terminal 16
TR(Left) to Terminal 18
TR(Right) to Terminal 19

Re-install the 150 plug and DIN rail connections as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 18 and BK3 to terminal 19 - DO NOT reverse.

Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

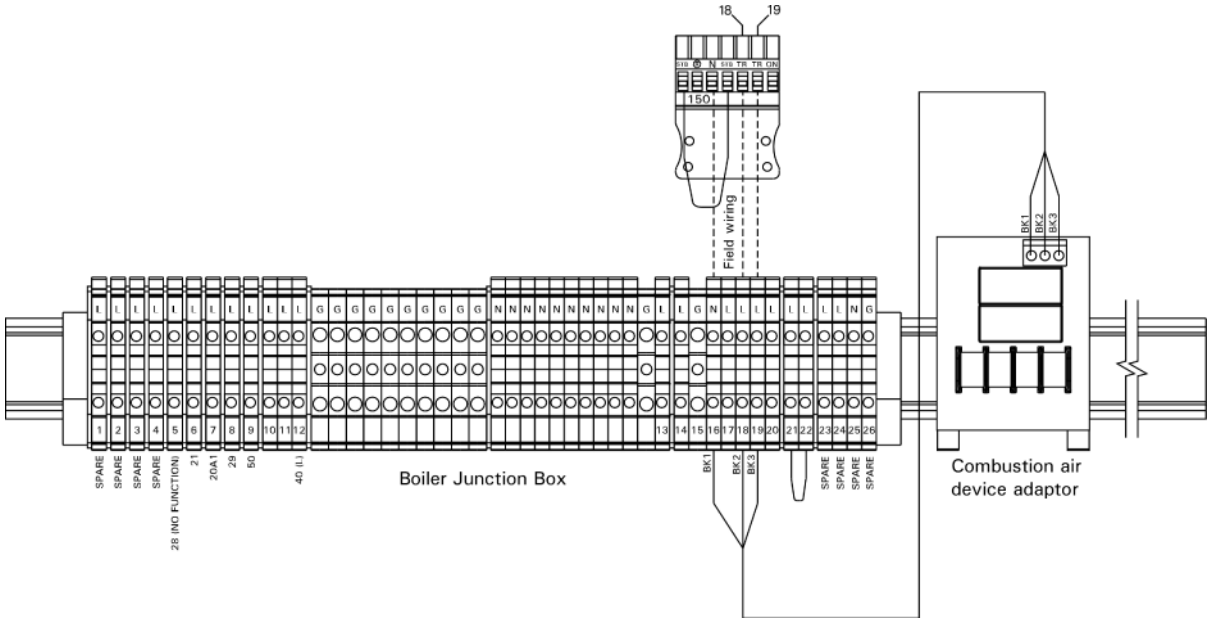
Ensure that combustion air blower device is suitable for this application.

For detailed instruction on adaptor installation please refer to the adaptor's installation manual.

1. Make connection as shown in the diagram at left.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Combustion air blower motor
Ⓒ Proving switch - "normally open" rated for 120 VAC.
Ⓓ Power supply, 120 VAC

⚠ ***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.



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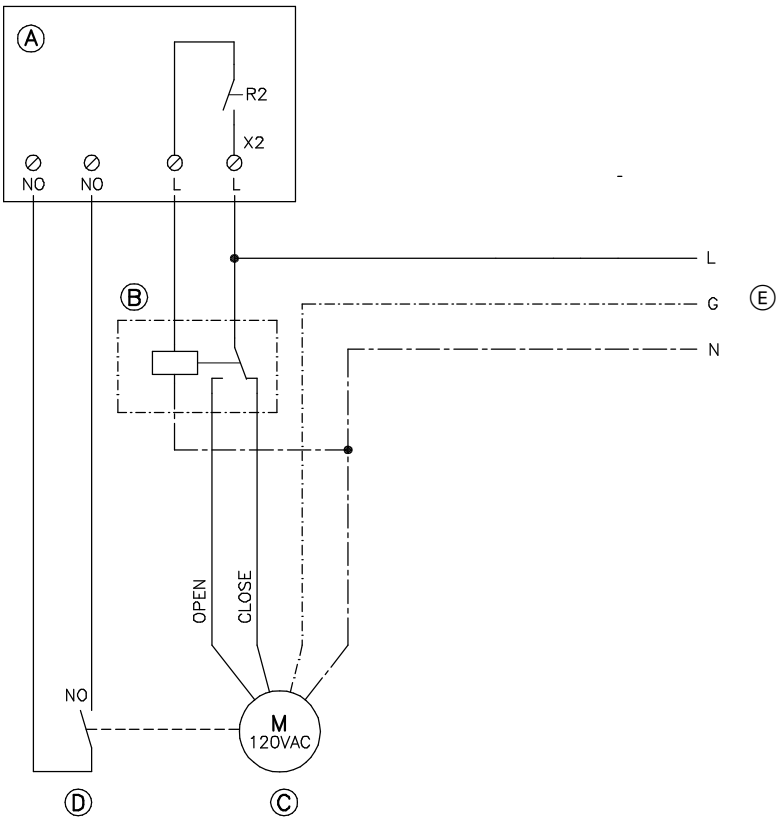
Connection of combustion air devices *(continued)*



Connection of the combustion air damper

See damper manual for correct installation.

Ensure that the combustion air damper is suitable for this application.

1. Disconnect power to control and burner.

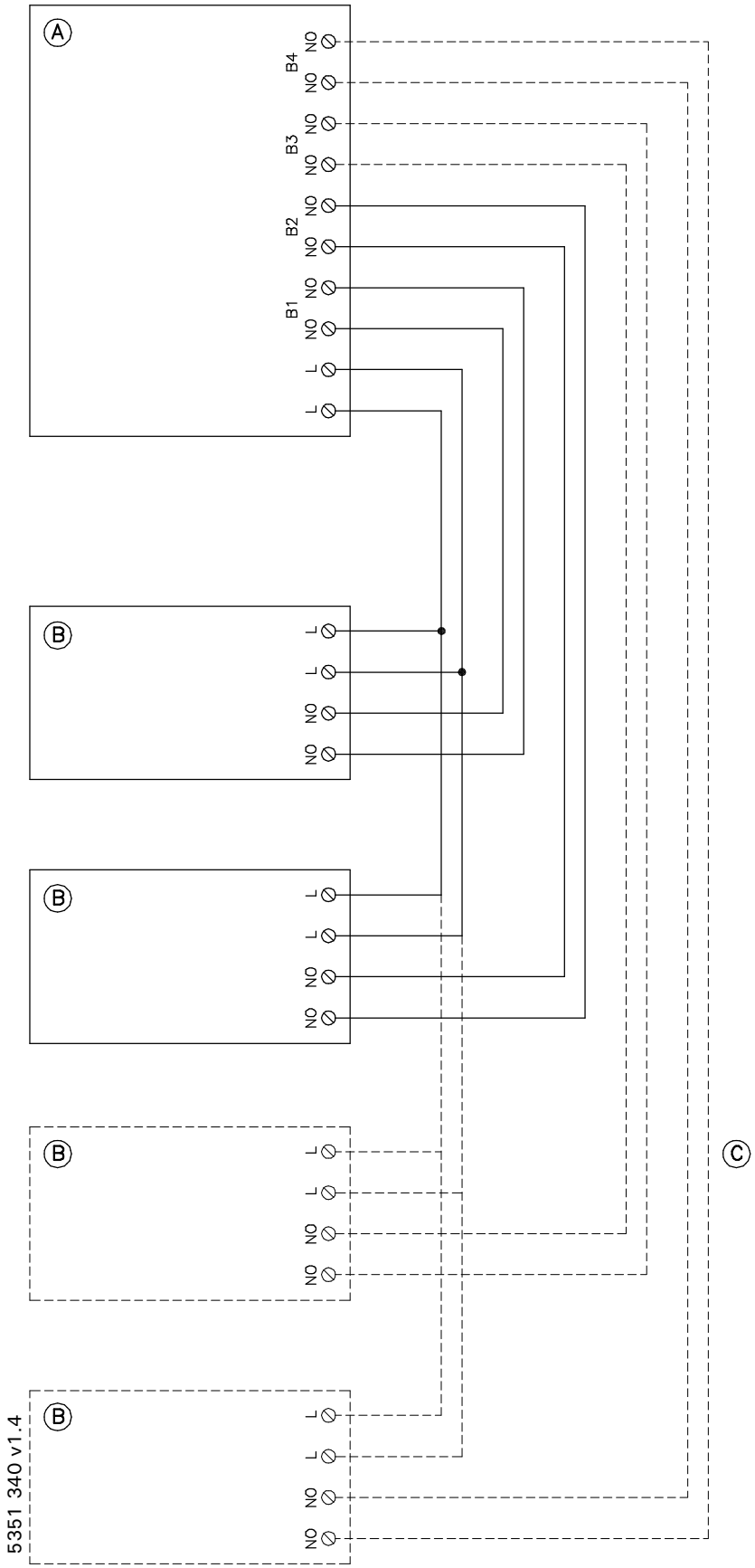
2. Make connection as shown in the diagram.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Relay 120 VAC coil - field supplied
Ⓒ Combustion air damper
Ⓓ End switch rated for 120 VAC
Wired to “normally open” terminal on device adaptor board
Ⓔ Power supply, 120 VAC

⚠ ***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.

Note:
Spring return air dampers do not require field supplied relay.

Connection of single combustion air devices on mulitple boiler system



If a single combustion air device is required for a multiple boiler system, a Common Combustion Air Interface must be installed.

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

1. Install Combustion Air Device Adaptor on each boiler.
Part No. 7134 563

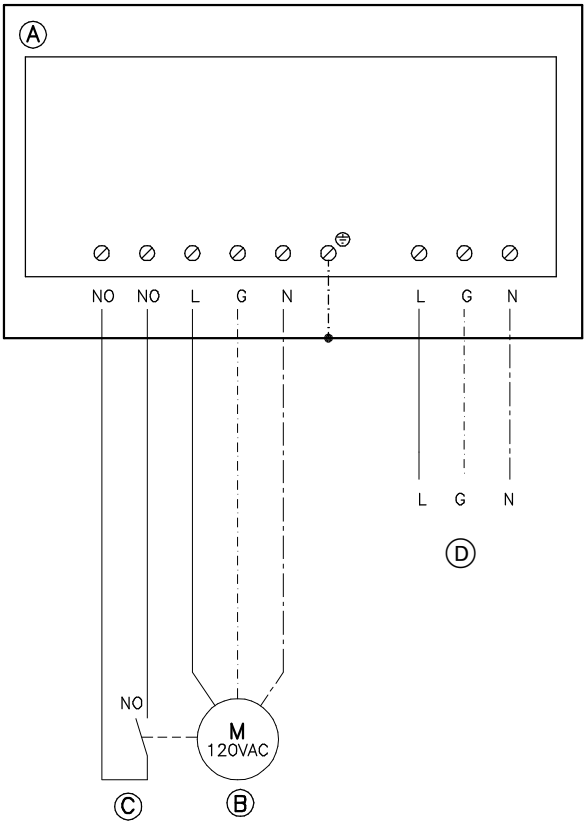
2. Install Common Combustion Air Device Interface,
Part No. 7134 604
as per supplied manual.

3. Make connection as shown in the diagram at left.

Ⓐ Common Combustion Air Device Interface (wall mount)
Ⓑ Combustion Air Device Adaptor in connection enclosure on each boiler
Ⓒ Interconnecting wiring (field supplied and connected)

Refer to Installation and Operating Instructions of Common Combustion Air Device Interface for details.

Connection of single combustion air devices on mulitple boiler system



Connection of the combustion air blower

Ⓐ Common Combustion Air Device Interface
Ⓑ Combustion air device motor 120VAC, 5 FLA max.
Ⓒ Proving switch rated for 120 VAC
Ⓓ Power supply, 120 VAC

⚠***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.

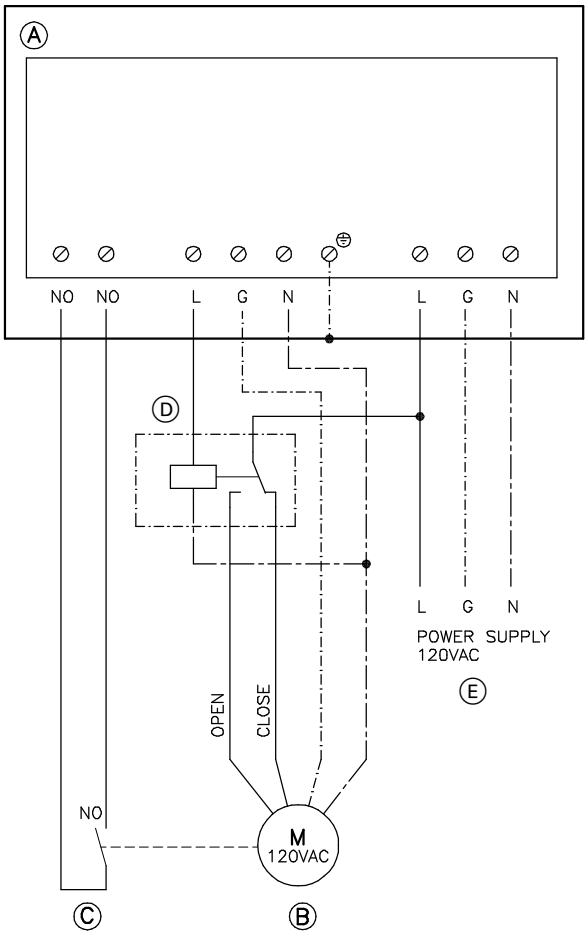
See blower manual for current rating to correctly select the fuse.

See Common Combustion Air Device Interface manual for Installation and Operating details.

1. Disconnect power to control and burner.

2. Make the connections as shown in the diagram.

Connection of single combustion air damper



Connection of the combustion air damper

Ⓐ Common Combustion Air Device Interface
Ⓑ Combustion Air Device Motor 120VAC, 5 FLA max.
Ⓒ Proving switch rated for 120 VAC
Ⓓ Power supply, 120 VAC

⚠ ***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.

See damper manual for current rating to correctly select the fuse.

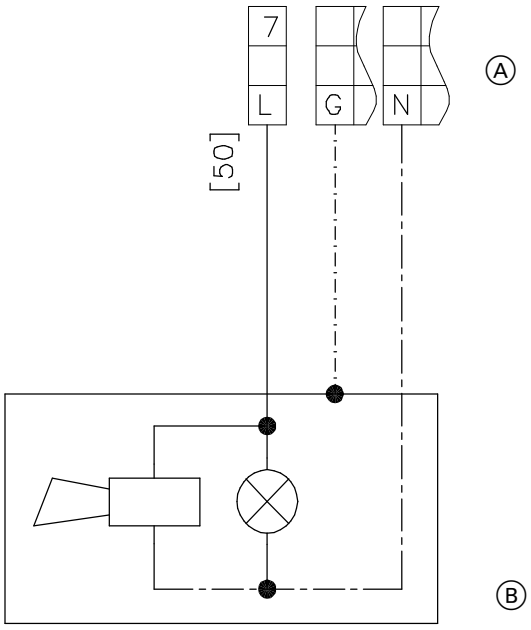
See Common Combustion Air Device Interface manual for Installation and Operating details.

1. Disconnect power to control and burner.

2. Make the connections as shown in the diagram.

Connection of the compiled failure alarm

(VD2/VD2A/CT3 only)



Rated voltage: 120 VAC 60 Hz
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

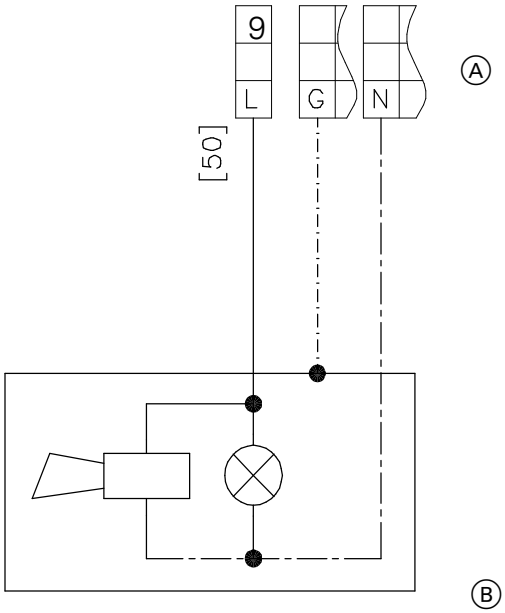
1. Disconnect power to control and burner.

2. Connect the compiled failure alarm as shown in the diagram.

Ⓐ Connect terminal strip in connection enclosure of boiler control

Ⓑ Visual and/or audible alarm device (120 VAC)

Connection of the compiled failure alarm (CM2 Only)



Rated voltage:
120 VAC 60 Hz
Rated current: *max. 2 FLA*
Recommended connection wire size: *AWG 14*

1. Disconnect power to control and burner.
2. Connect the compiled failure ... alarm as shown in the diagram.
Ⓐ Connect terminal strip in connection enclosure of boiler control
Ⓑ Visual and/or audible alarm device (120 VAC)

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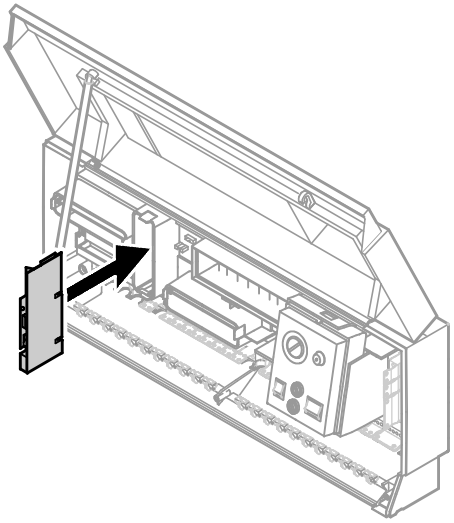
Plugging in the LON communication module



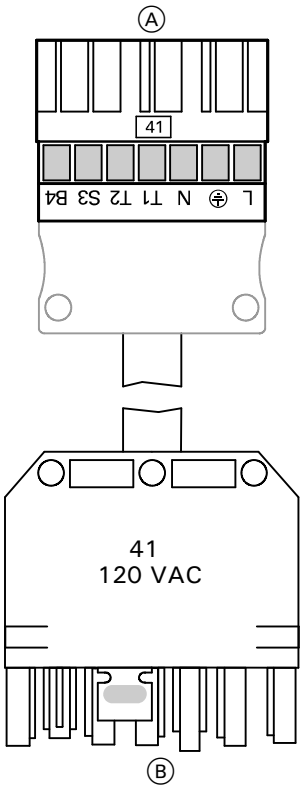
Plug in the LON communication module in accordance with the illustration in the control unit.

Making the LON connection

See page 71.

Burner connection, burner control wiring (VD2/VD2A/CT3 only)

For burners with plug-in connection



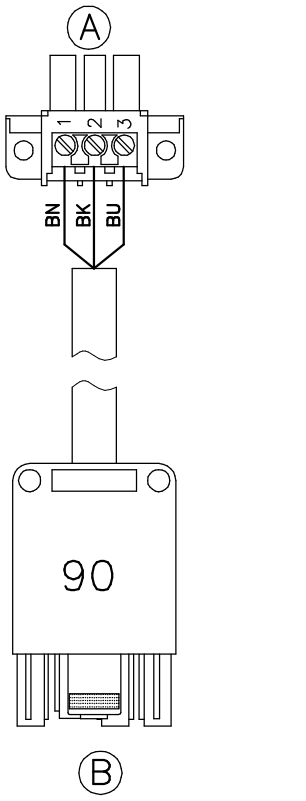
The burner cables are included in the standard delivery of the Vitotronic.
Connect the burner in accordance with applicable codes.

Ⓐ To boiler control unit
Ⓑ To burner

Terminal codes

L1	Phase via fixed high limit to the burner
⏚	Ground connection
N	Neutral connection to the burner
T1,T2	Control circuit
S3	Connection for burner fault indicator
B4	Connection for burner hours counter

1. Disconnect power to burner and boiler control.
2. Connect plug [41] and plug [90] to respective counter plugs in boiler control unit.
3. Connect the 7-pole plug [41] and the 3-pole plug [90] to the burner.



Ⓐ To plug-in connection in connection enclosure
Ⓑ To burner

Terminal codes

1,2,3	Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
1	From burner
2	Modulating down
3	Modulating up/2nd stage ON

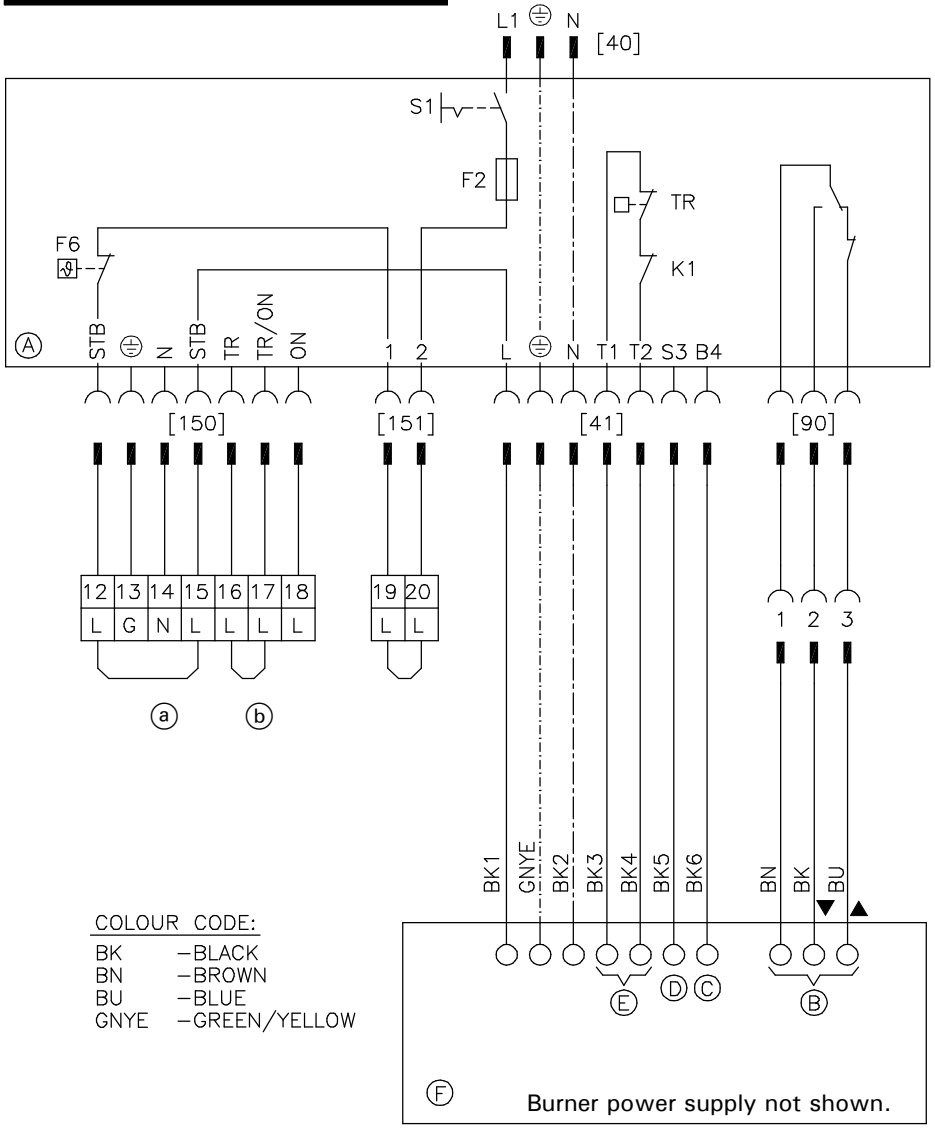
Colour codes as applicable

BK	Black
BN	Brown
BU	Blue

Burner connection, burner control wiring (VD2/VD2A/CT3 only) *(continued)*

CAUTION

This is a generic connection drawing only! Follow the burner manufacturer's connection drawings for Viessmann controls.



Write the terminal numbers or markings on the drawing for future reference.

Ⓐ Control unit
(Legend: see wiring diagram)
Ⓑ 2nd stage or modulating *1
Ⓒ Hours counter, stage 1 *1
Ⓓ Burner fault indicator *1
Ⓔ Control circuit, stage 1/ basic load *1
Ⓕ Burner

[40] Power supply connection of control unit 120 VAC
[41] Burner, 1st stage
[90] Burner, 2nd stage

[150] Plugs for external equipment
ⓐ External safety devices (remove jumper when connecting)
ⓑ External controlled switch-off (remove jumper when connecting)
[151] Safety circuit. Emergency shut-off

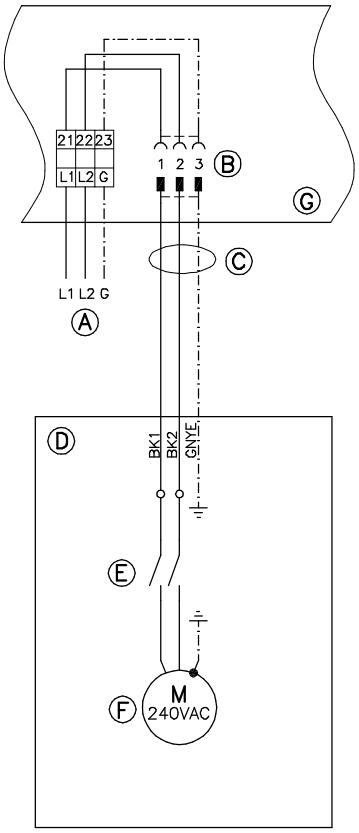
*1 *Refer to burner manufacturer's instruction on detailed connections for Viessmann controls.*

Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

For burners with 240 VAC, 1PH power supply and connection in conduit.

See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.



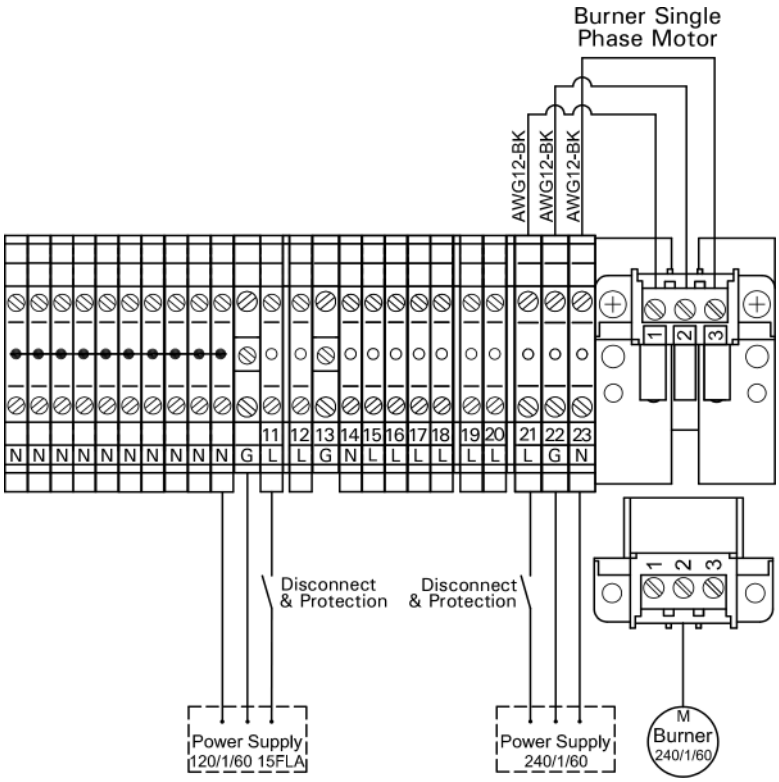
Ⓐ Burner motor power supply 240 VAC, 1PH
Ⓑ Connection terminals and plug inside connection enclosure
Ⓒ Cable and conduit- factory supplied
Ⓓ Burner
Ⓔ Motor starter
Ⓕ Burner motor
Ⓖ Connection enclosure on boiler control

1. Disconnect power to burner and boiler control.

2. Connect 240 VAC power to the terminals 21, 22 and 23 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.

3. Connect supplied power cable to the motor terminals on the burner.

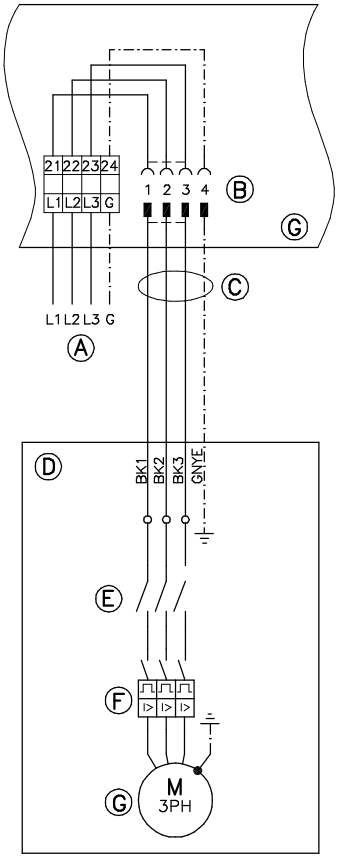
4. Connect cable plug to the socket on the DIN rail in the connection enclosure.


Burner Single Phase Motor
AWG12-BK
AWG12-BK
AWG12-BK
N N N N N N N N N G L L G N L L L L L L L G N
11 12 13 14 15 16 17 18 19 20 21 22 23
1 2 3
Disconnect & Protection
Disconnect & Protection
Power Supply 120/1/60 15FLA
Power Supply 240/1/60
M
Burner
240/1/60

Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

For burners with 3PH 208, 460 or 575V power supply.



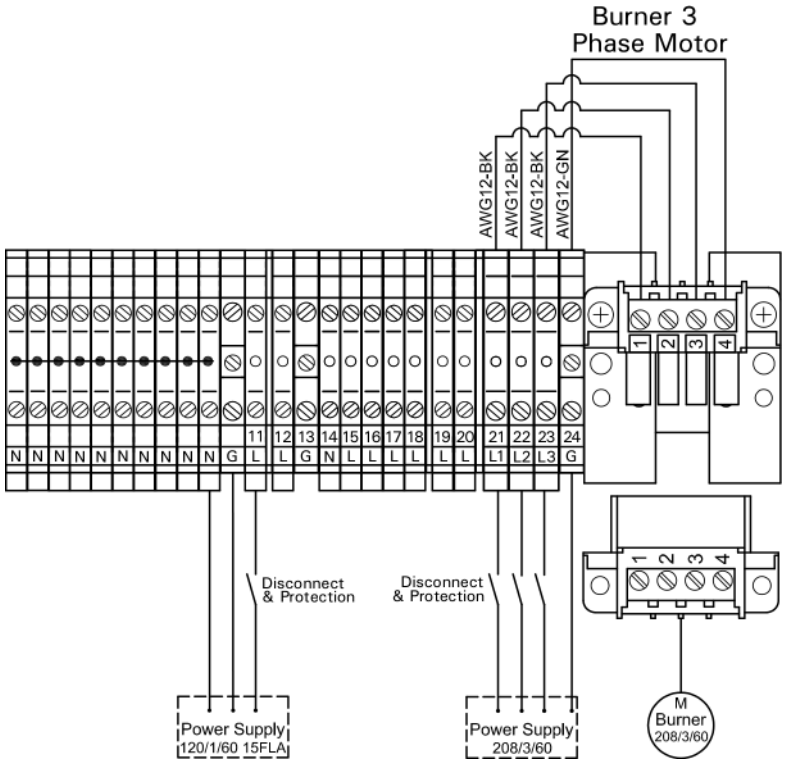
Ⓐ Burner motor power supply 3PH 208, 460 or 575V
Ⓑ Connection terminals and plug inside connection enclosure
Ⓒ Cable and conduit - factory supplied
Ⓓ Burner
Ⓔ Motor starter
Ⓕ Overload
Ⓖ Burner motor
Ⓗ Connection enclosure

See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.

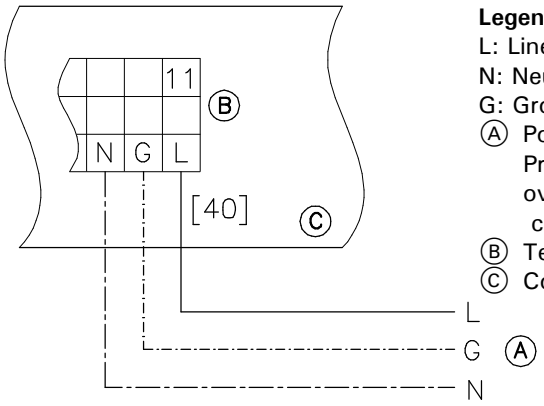
1. Disconnect power to burner and boiler control.
2. Connect 3PH power to the terminals 21, 22, 23 and 24 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.
3. Connect supplied power cable to the motor terminals on the burner.
4. Connect cable plug to the socket on the DIN rail in the connection enclosure.

⚠ CAUTION

During commissioning check for correct motor rotation. If motor rotates in opposite direction than indicated on the burner, disconnect power supply and reverse wires BK1 and BK2 on the burner terminals.



Power Supply Connection, Boiler Control (VD2/VD2A/CT3 only)



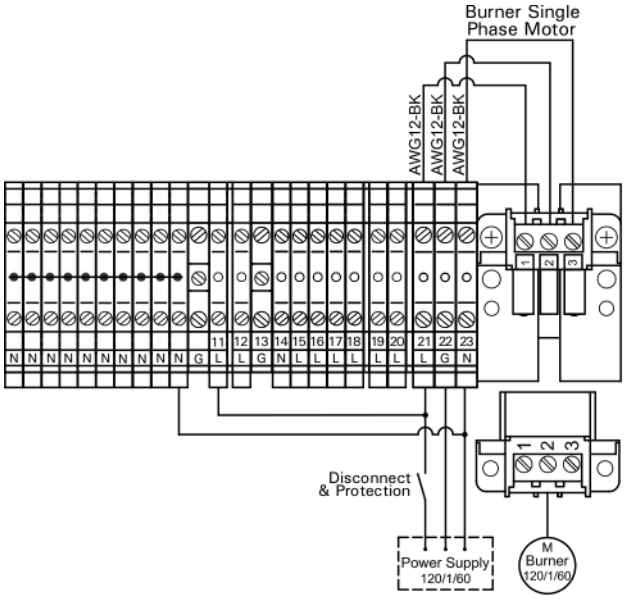
Legend
L: Line
N: Neutral
G: Ground
Ⓐ Power supply 120 VAC, 1 PH . Provide disconnect means and overcurrent protection as per local codes
Ⓑ Terminals [40]
Ⓒ Connection enclosure

1. Ensure that the main power supply to the control contains overcurrent protection with a maximum rating of 15 A and 2 pole disconnect.

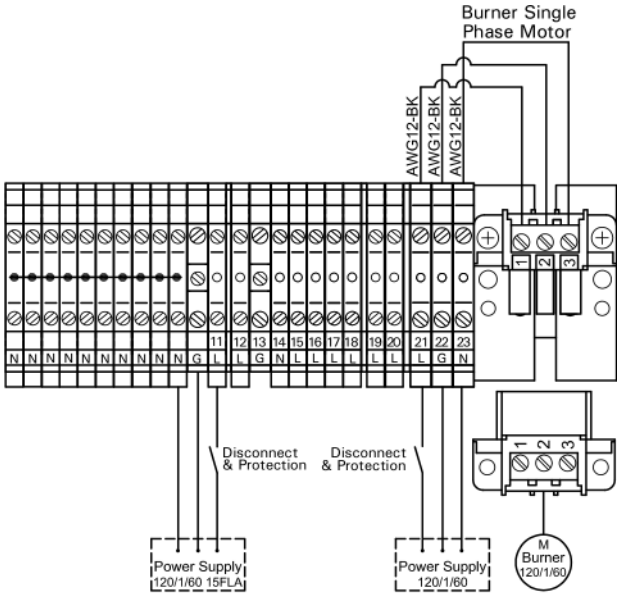
⚠ CAUTION

The control must be grounded. Ensure that "L", "N" and "G" are not interchanged.

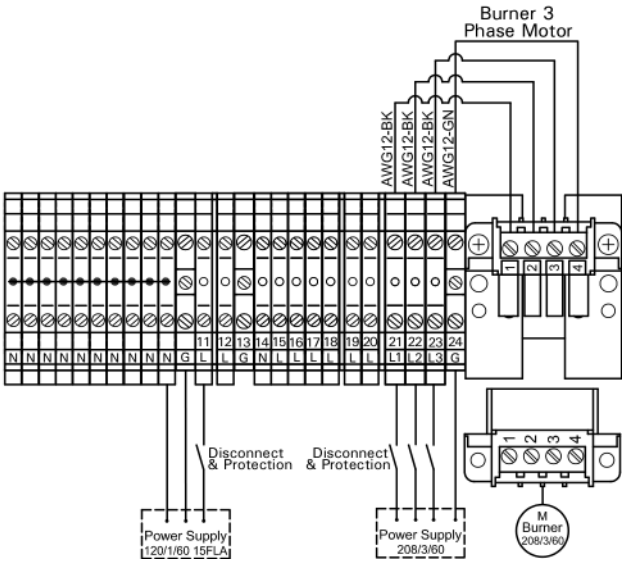
2. Connect power supply wire to the Connection [40] terminals 11, N and G on the DIN rail inside the connection enclosure.



OR

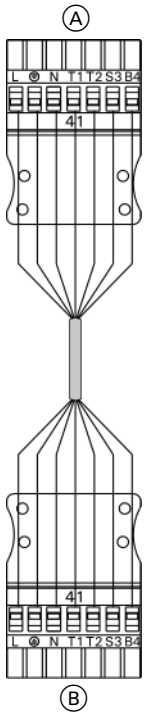


Supply power must be sufficient to cover both the 15A control power plus the required motor amperage.



Burner Connection, Burner Control Wiring (CM2 only)

For burners with plug-in connection



The burner cables are included in the standard delivery of the Vitotronic.
Connect the burner in accordance with applicable codes.

Ⓐ To boiler control unit
Ⓑ To burner interface

Terminal codes

L1 Phase via fixed high limit to the burner
⏚ Ground connection
N Neutral connection to the burner
T1,T2 Control circuit
S3 Connection for burner fault indicator
B4 Connection for burner hours counter

1. Disconnect power to burner and boiler control.

2. Connect plugs 41 and plug 90 to respective counter plugs in boiler control unit.

3. Connect the 7-pole plug 41 and the 3-pole plug 90 to the burner.

Ⓐ To plug-in connection in connection enclosure
Ⓑ To burner interface

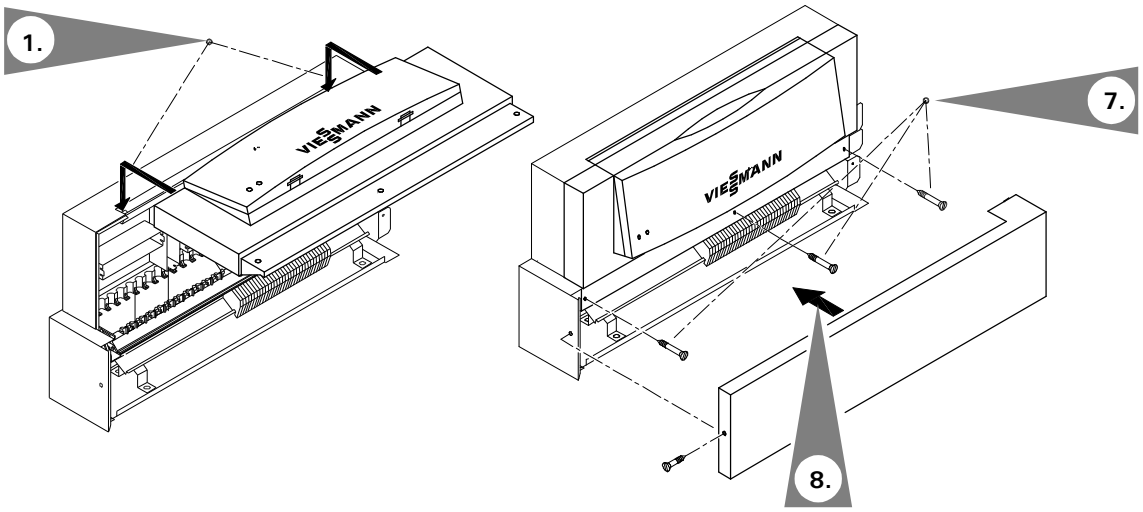
Terminal codes

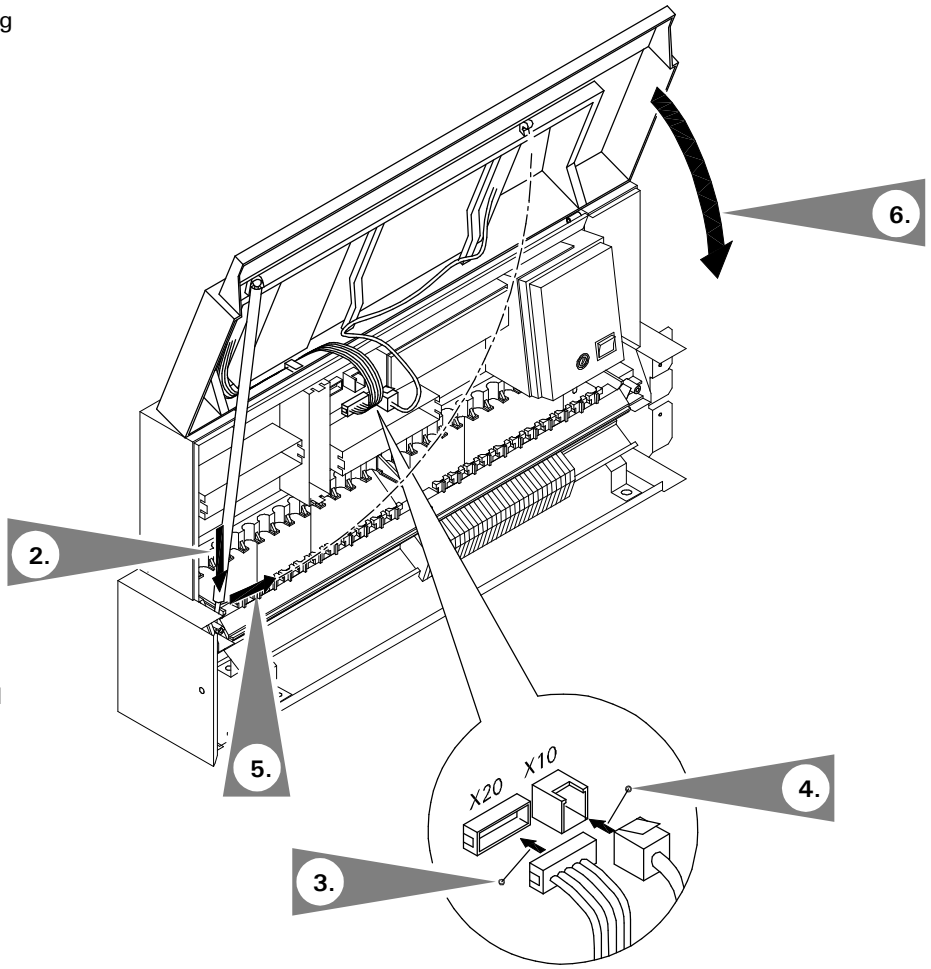
1,2,3 Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
1 From burner
2 Modulating down
3 Modulating up/2nd stage ON

Colour codes as applicable

BK Black
BN Brown
BU Blue

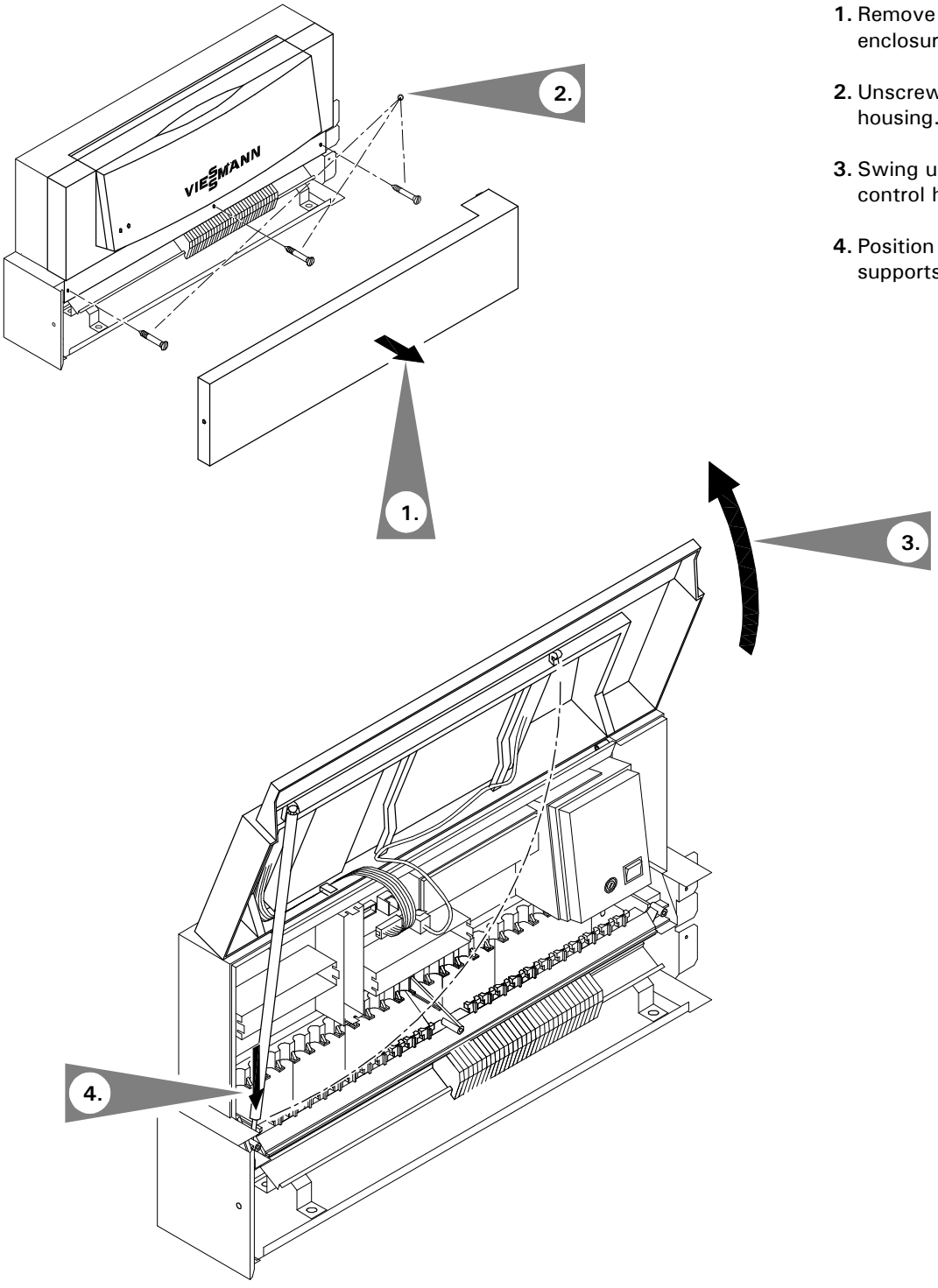
Installing the control unit front (VD2/VD2A/CT3 only)





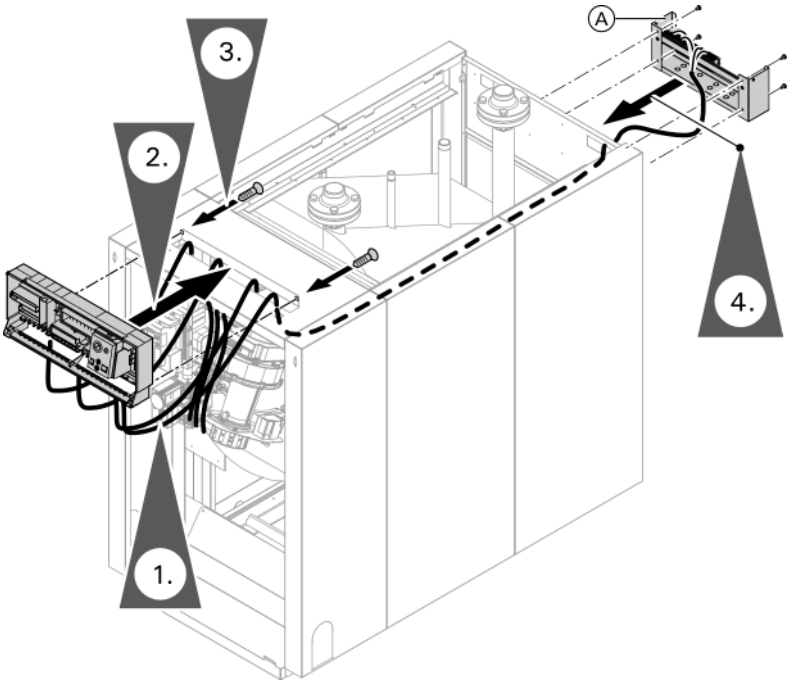
1. Position the front part of the housing and clip hinges to counter-parts on main housing.
2. Release the stay bar, open it up and lock in position at point Ⓐ.
3. Insert the flat cable from the Optolink into plug "X20".
4. Insert the plug of the programming unit into plug "X10". Use cable guides in cover for routing.
5. Engage the stay bar in the front housing.
6. Close the front of the housing.
7. Secure front housing with supplied screws.
8. Install cover of the connection enclosure and support with supplied screw.

Opening the control unit (VD2/VD2A/CT3 only)



1. Remove the cover of the connection enclosure.
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Control and Junction Box Installation Instructions (for CM2 only)



1. Route cables and capillaries from control through the opening in the control panel. Guide the cables to the junction box through the opening in the rear panel and along the top rail to the control. Secure all cables to the rail with cable ties. Insert capillaries into the sensor well.
   Note: Never allow cables to come in contact with hot metal components.

WARNING

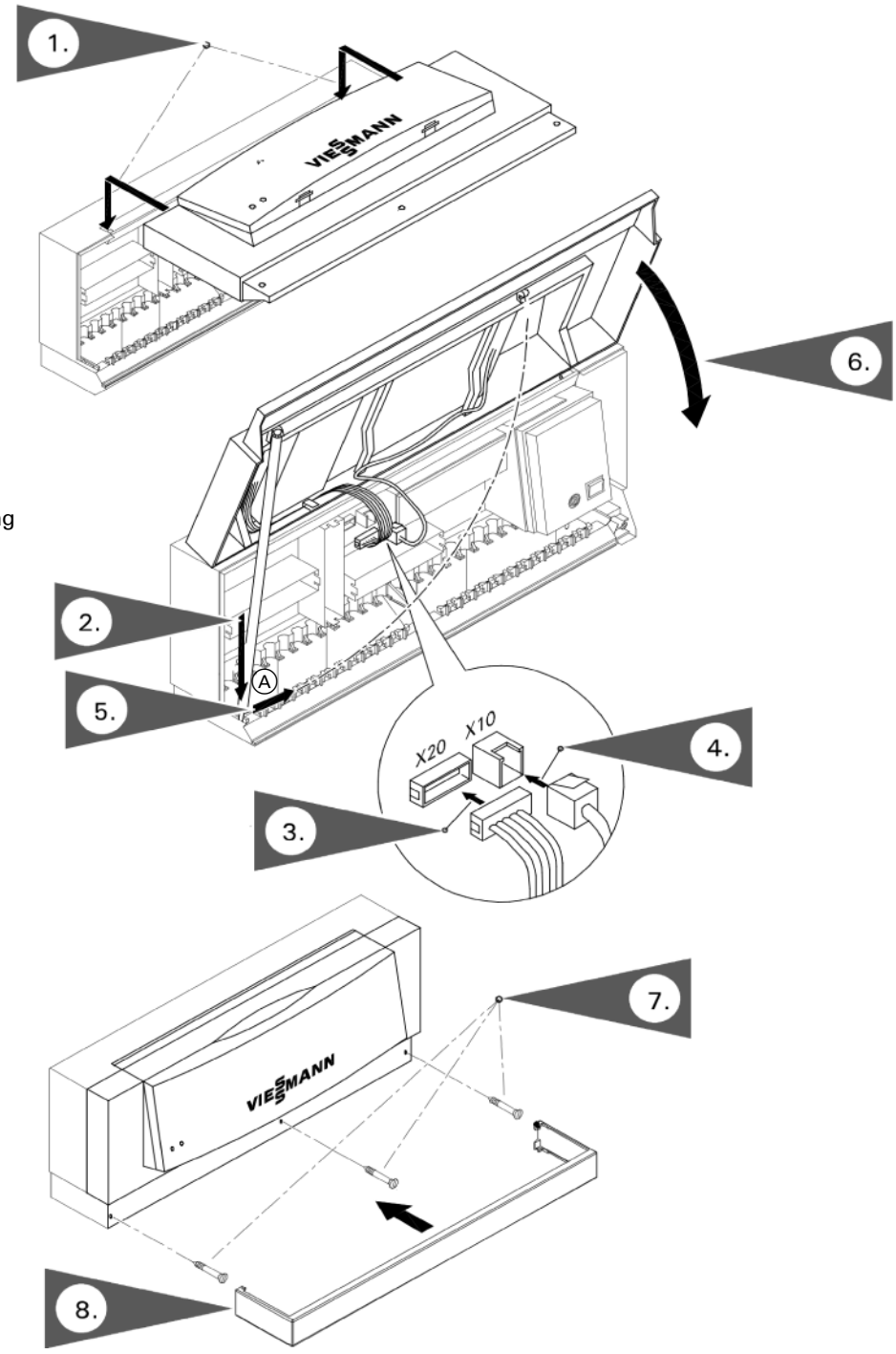
Do not bend or kink the capillaries. Damaging the capillaries leads to malfunction.

2. Mount the control to the control panel.

3. Secure the control to the control panel with screws.
   Note: Screws to secure control are included with the cosmetic cover in the boiler jacketing package.

4. Install the junction box to the rear panel either right or left. Secure the junction box with 4 x 4.8 metal screws.
   Note: The ground screw and ground wire can be removed and then reinstalled with the boiler back panel attached.

Mounting the Front Part of the Control Unit (CM2 only)



1. Position the front part of the housing and clip hinges to counter-parts on main housing.

2. Release the stay bar, open it up and lock in position at point Ⓐ.

3. Insert the flat cable from the Optolink into plug "X20".

4. Insert the plug of the programming unit into socket "X10". Use cable guides in cover for routing.

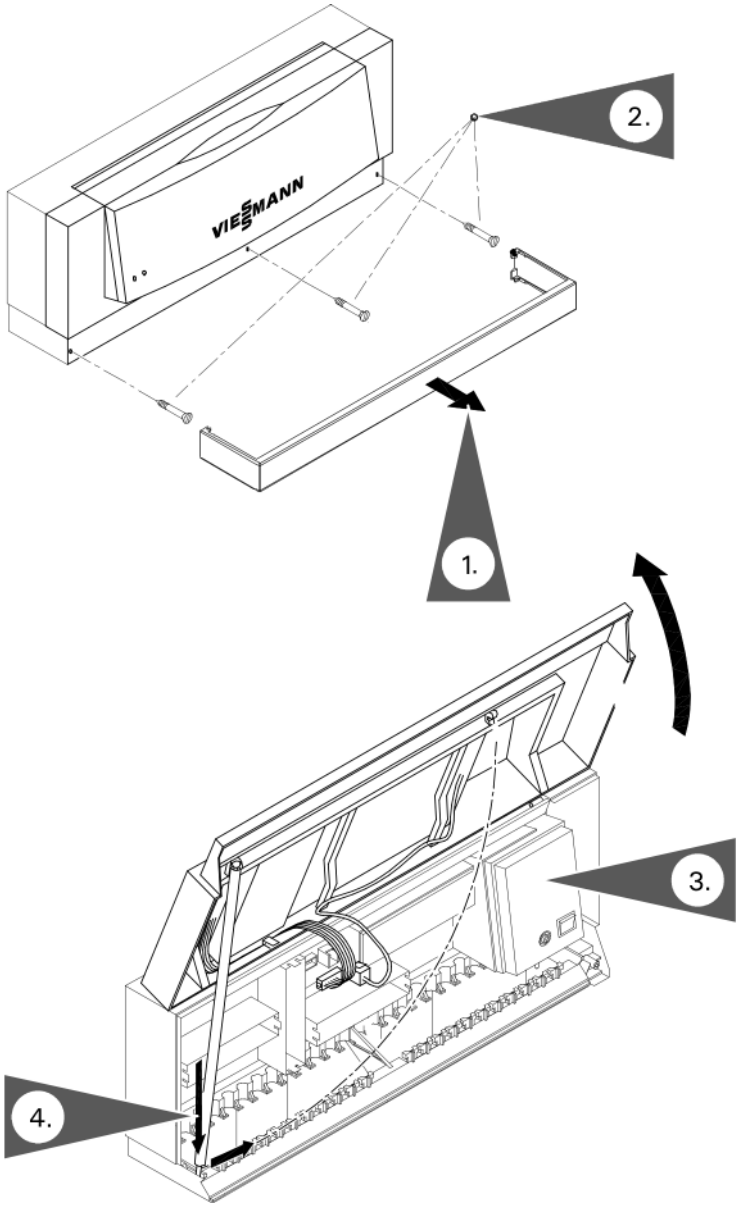
5. Engage the stay bar in the front housing.

6. Close the front of the housing.

7. Secure front housing with supplied screws.

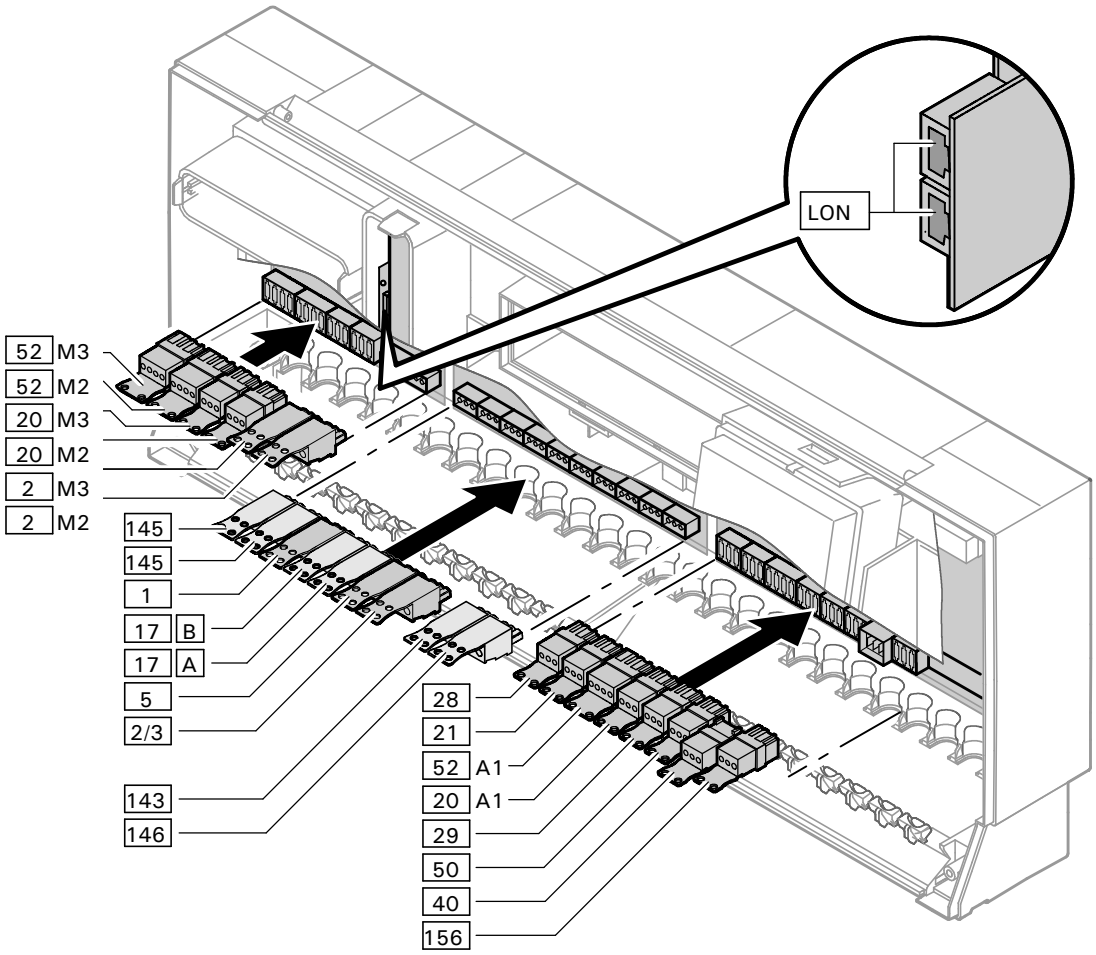
8. Install control cosmetic cover.

Opening the Control Unit (CM2 only)



1. Remove the control cosmetic cover .
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Summary of electrical connections



Mixing valve extension circuit board

- 2 M2/M3 Supply temperature sensor
- 20 M2/M3 Heating circuit pump
- 52 M2/M3 Mixing valve actuator

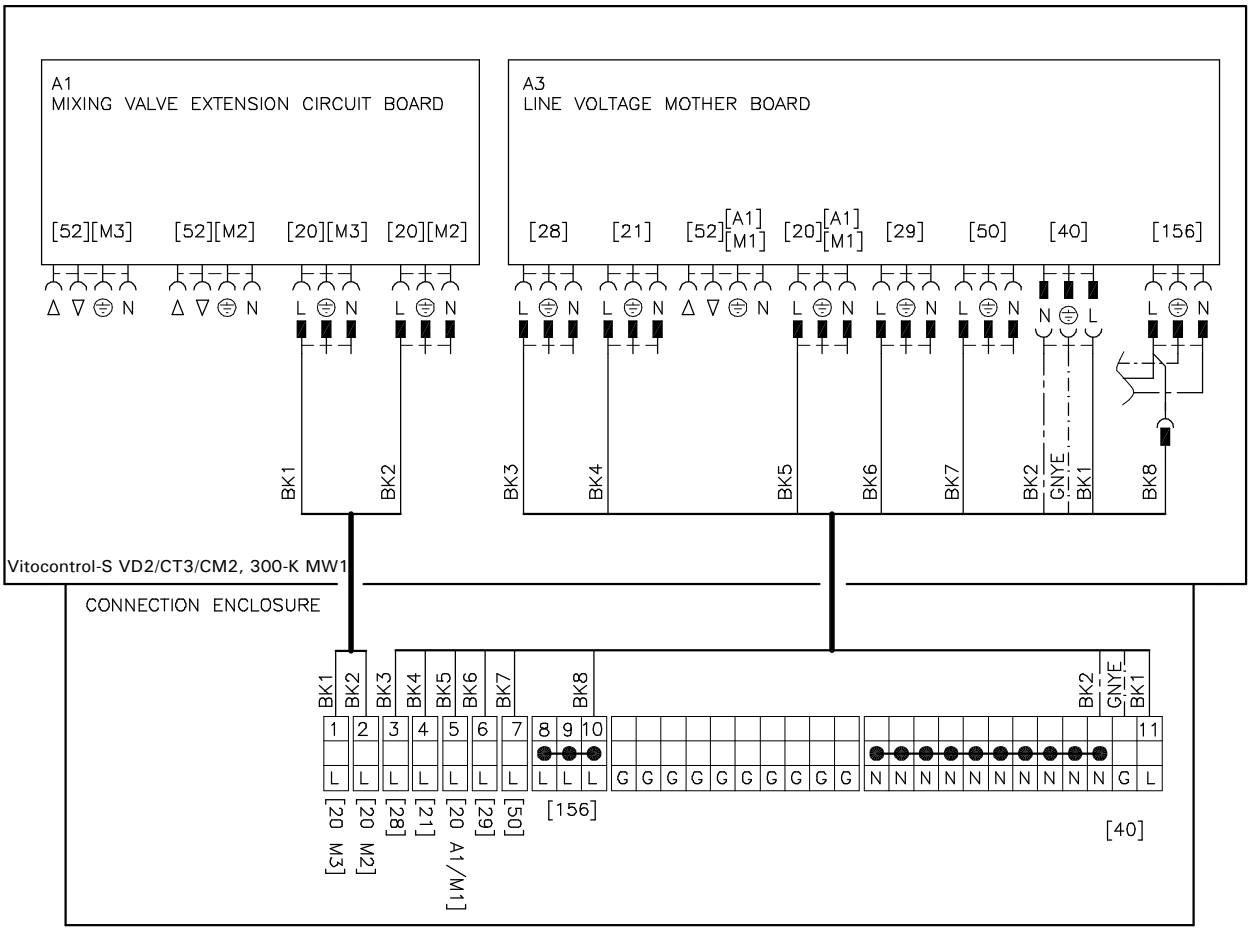
Low voltage motherboard

- 1 Outdoor temperature sensor
- 2 Common supply temperature sensor
- 5 DHW tank temperature sensor
- 17 A Temperature sensor T1 (accessory)
- 17 B Temperature sensor T2
- 143 Connection
- 145 KM BUS
- 146 Connection for external equipment
- LON LON BUS, interconnecting cable for data transfer between the control units

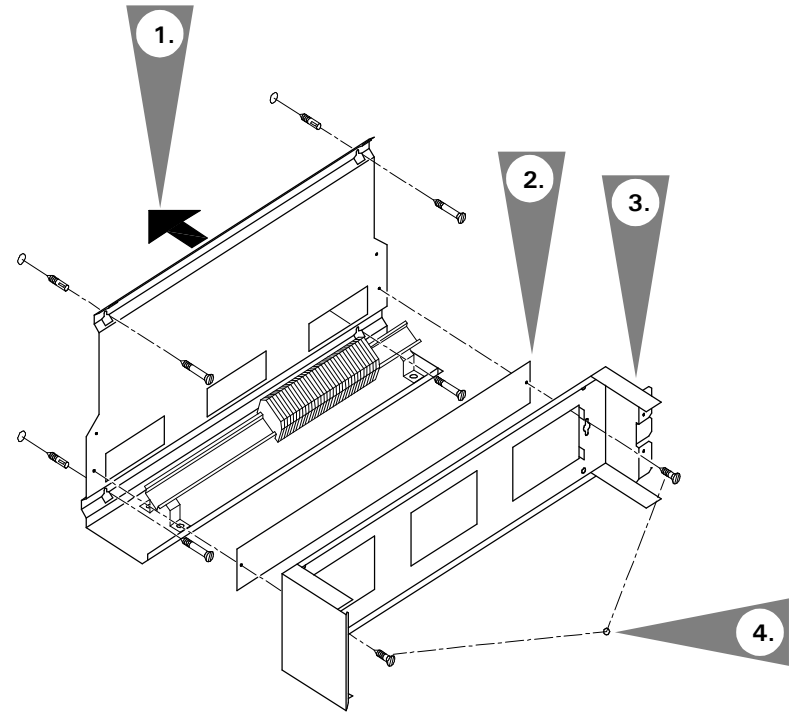
Line voltage motherboard

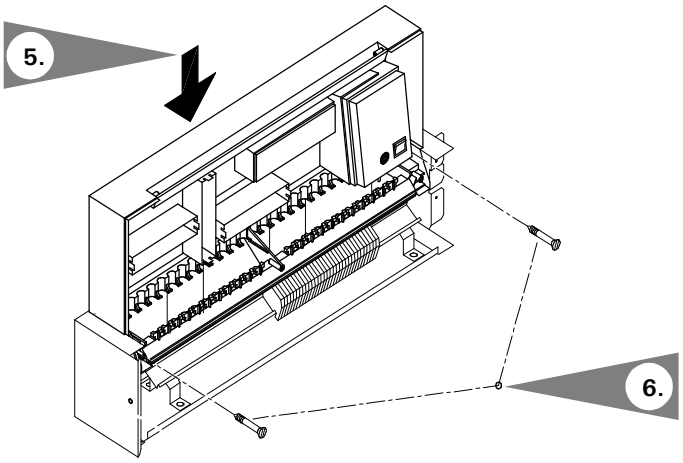
- 20 A1 Heating circuit pump
- 21 DHW pump
- 28 DHW re-circulation pump
- 29 Shunt pump
  or
  Boiler circuit pump
- 40 Power supply connection
- 50 Compiled failure alarm
- 52 A1 Three-way return valve
- 156 Internal power supply for mixing valve extension circuit board and connections for accessories

Summary of electrical connections *(continued)*



Mounting of the control unit





1. Fasten metal backplate onto mounting surface with four fasteners.

2. Position midplate between backplate and connection enclosure.

3. Install midplate and connection enclosure onto backplate.

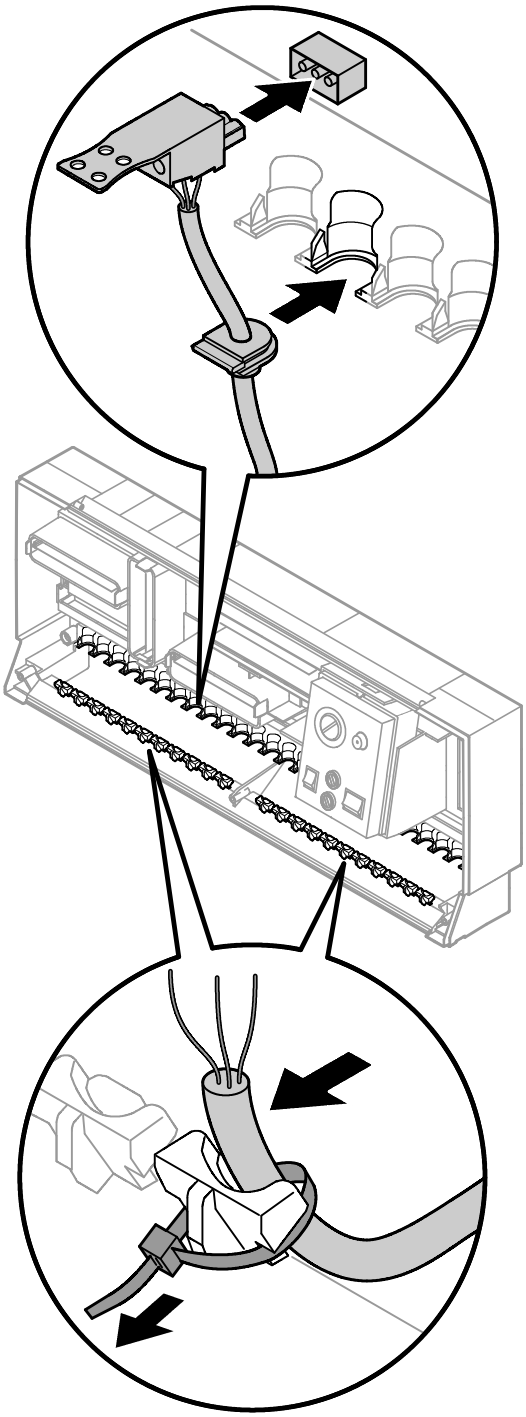
4. Fasten connection enclosure and midplate onto backplate with two fasteners.

5. Install control rear section onto connection enclosure housing. Hook control onto backplate tabs and pivot downwards.

6. Fasten control rear section onto connection enclosure with two fasteners.

Inserting cables and applying strain relief

Run the cables from the connection enclosure into the control unit.
Apply strain relief to cables (see below).



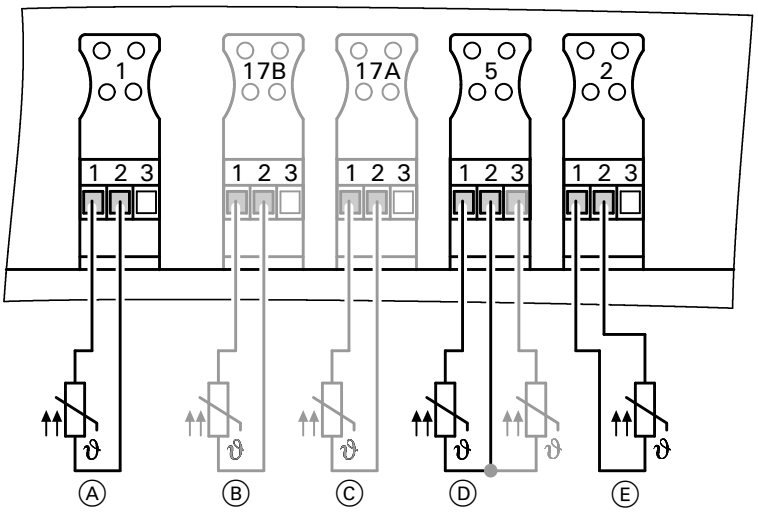
Cables with moulded strain relief clamp

Connect cable and strain relief clamp.

OR

Fasten cable to the cable lead with cable tie.

Sensor connection



Ⓐ Outdoor temperature sensor (not polarity sensitive)
Ⓑ Return temperature sensor T2
Ⓒ Temperature sensor T1
Ⓓ DHW tank temperature sensor
Ⓔ Supply temperature sensor – common heating supply

Installation location:

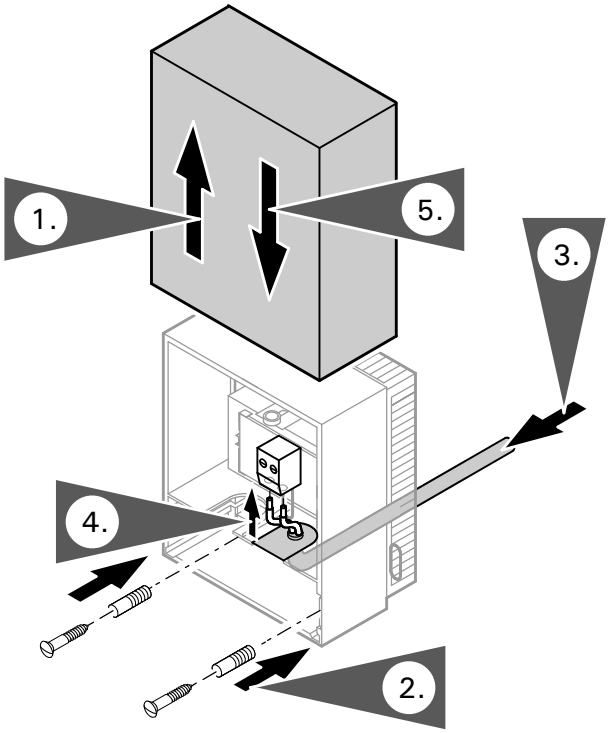
- North or north-western wall. In multi-storey buildings, in the upper half of the second floor.
- Not above windows, doors or ventilation outlets.
- Not immediately below balcony or gutter.
- Do not paint over.

Connection:
Two-wire cable, max. 35m (120ft.) length, AWG 16.

Sensor connection *(continued)*

Outdoor temperature sensor

The outdoor temperature sensor should be mounted 2 to 2.5m / 6.5 to 8 ft above ground level on the north or north-west facing wall of the building. In the case of multi-storey buildings, it should be mounted in the upper half of the second storey. Make sure that the sensor is not located over windows, doors and air vents, nor immediately beneath a balcony or guttering.
Do not paint over the outdoor temperature sensor housing.



1. Remove the cap.

2. Mount the bottom part of the sensor housing.

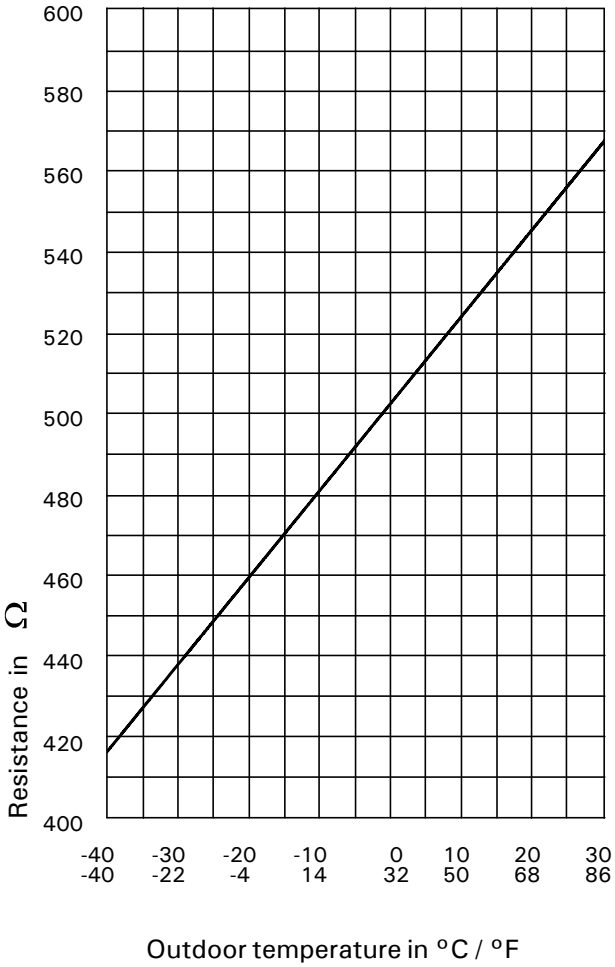
3. Pull the sensor wire through the opening in the terminal compartment and through the strain relief provided.

4. Connect the wires to the terminals.

5. Place the cap over the outdoor temperature sensor.

WARNING

When extending wire, there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair or shield design wire. Ensure that only one end of the shielding is grounded.

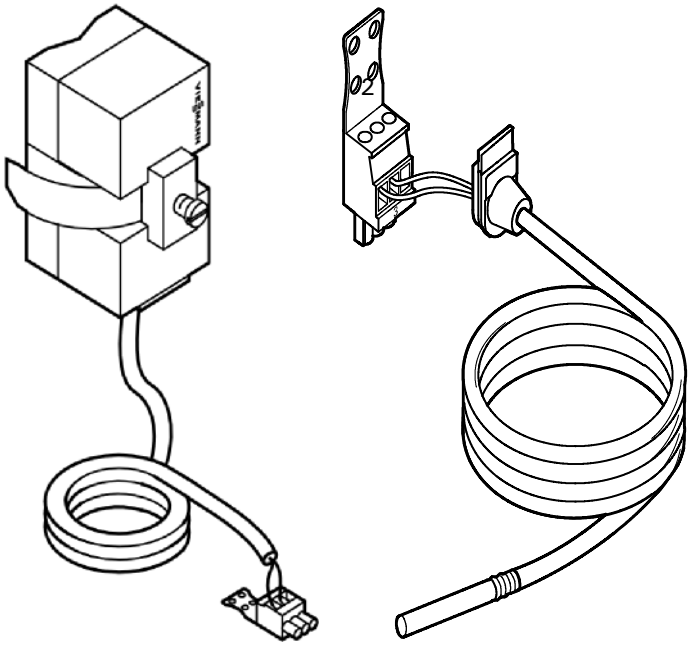


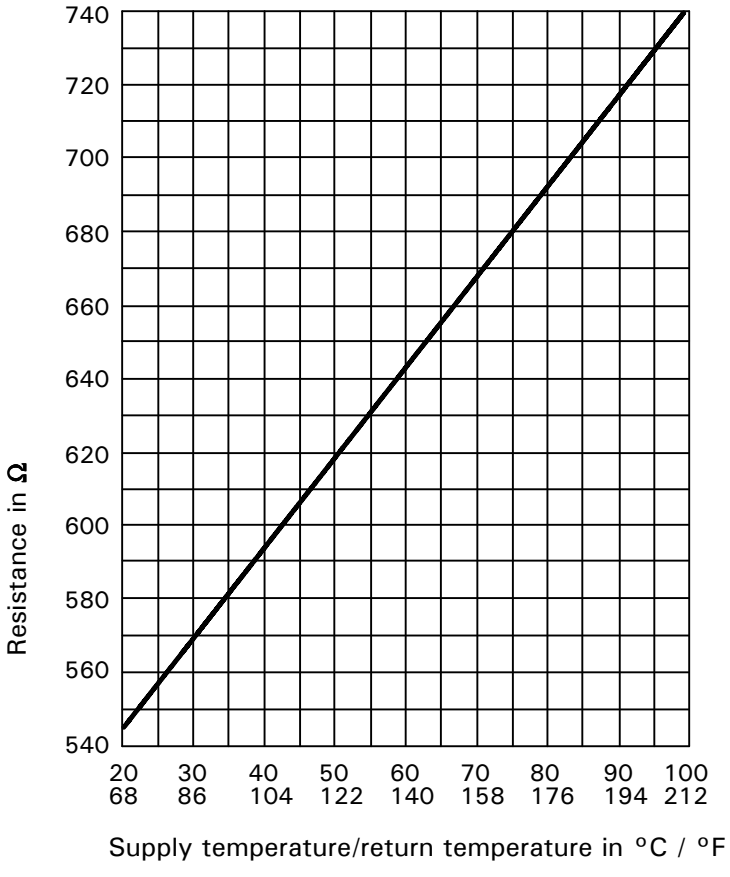
5351 340 v1.4

Sensor connection *(continued)*

Strap-on temperature sensor and immersion temperature sensor

*For measuring the **supply** temperature.*





Electrical connection
The sensor is inserted in socket 2 on the control unit.

Check the sensor

1. Disconnect plug 2 in the terminal compartment.
2. Measure resistance of sensor at terminal "2" of the plug.

Flow/return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

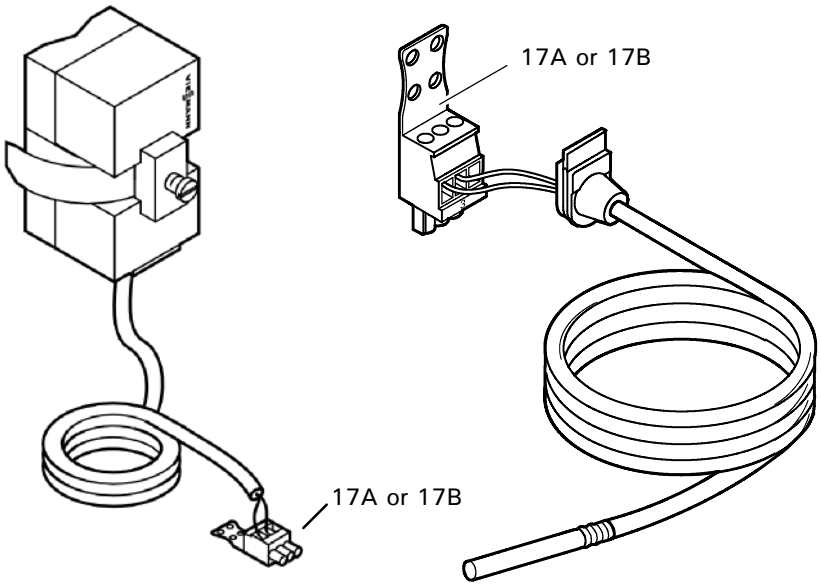
3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

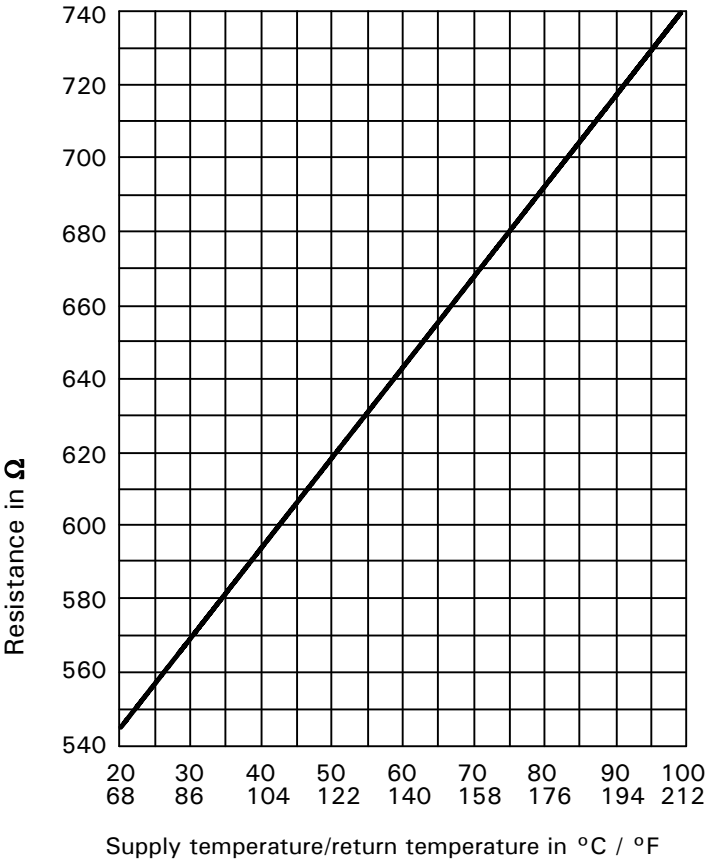
Technical data
Degree of protection: IP 32
Ambient temperature
- During operation:
  0 to + 100°C
  32 to + 212°F
- During storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

5351 340 v1.4

Sensor connection *(continued)*

Strap-on temperature sensor and immersion temperature sensor





*For measuring the **return** temperature.*

Electrical connection
The sensor is inserted in socket "17A" or "17B" on the control unit.

Check the sensor

1. Disconnect plug 17 A or 17 B in the terminal compartment.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Flow/return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

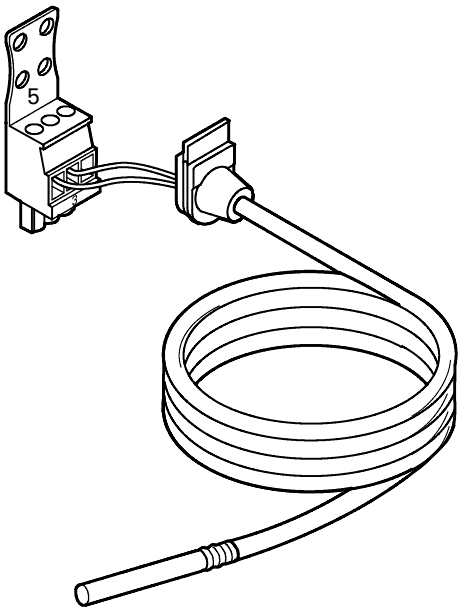
3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- During operation:
  0 to + 100°C
  32 to + 212°F
- During storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

Sensor connection *(continued)*

DHW tank temperature sensor

*The sensor measures the **domestic hot water tank** temperature.*



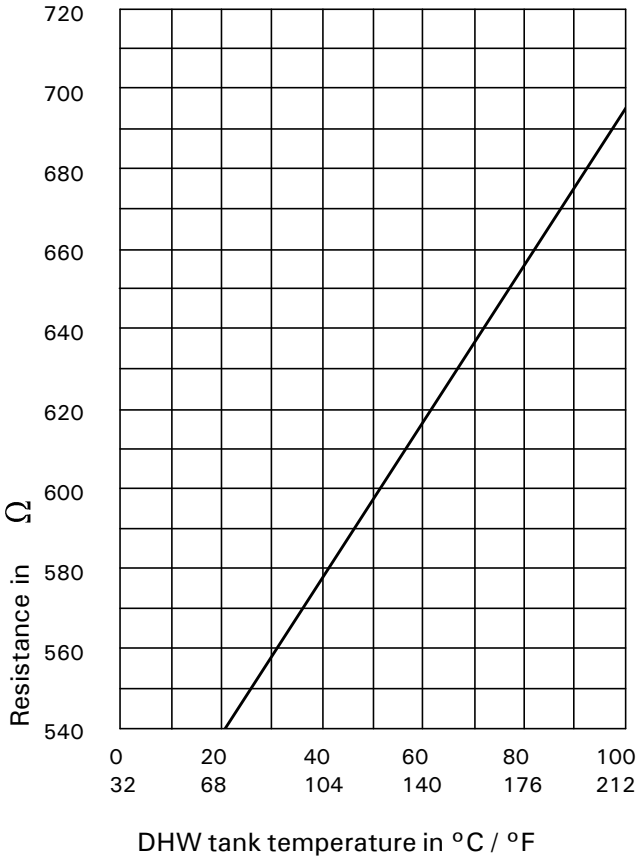
Heating systems with domestic hot water heating (single-boiler systems only)

1. Install the DHW tank temperature sensor.

See installation instructions for domestic hot water tank

Please note:
When installing the sensor in DHW tanks of other makes, make sure that the sensor is pressed against the sensor well of the DHW tank by means of a suitable device.

2. Ensure that the **maximum** permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.



Check the sensor

1. Disconnect plug [5] in the terminal compartment of the boiler control.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

DHW tank temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- During operation:
  0 to + 90°C
  32 to + 194°F
- During storage and transport:
  -20 to + 70°C
  - 4 to + 158°F

Electrical connection
The sensors are ready to plug in. Insert the DHW temperature sensor in socket "5" of the boiler control.

Heating systems without domestic hot water heating
Do **not** connect the DHW tank temperature sensor.

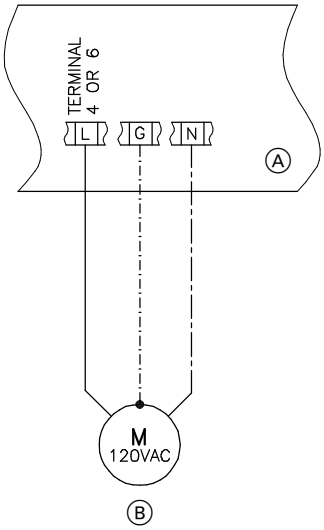
5351 340 v1.4

Connection of the pumps

Available pump connections

21 DHW pump for heating up the domestic hot water tank - Terminals 4 - L, - G , - N

29 Shunt pump, boiler circuit pump Terminals 6 - L, - G, - N.



Install pumps: see manufacturer's instructions.

120 VAC pumps

Please note:
The maximum power consumption of all pumps is 4A .
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:
Use contactor to switch pump.
For activating the contactor:
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

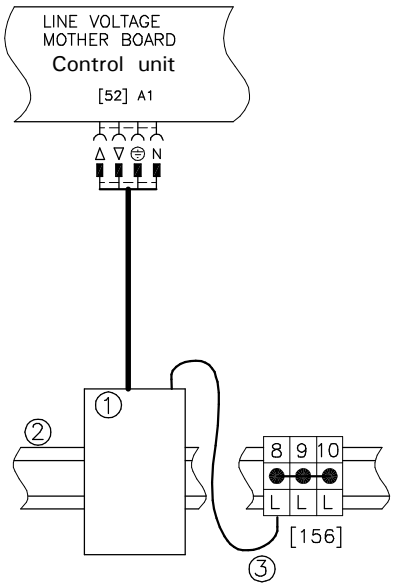
Please ensure that all connections and cable gauge comply with local and national codes.

1. Select the contactor and the connecting cable in accordance with the rating of the pump that is to be connected.

2. Connect the pump and power supply to the contactor.

3. Connect contactor coil to the corresponding terminals.

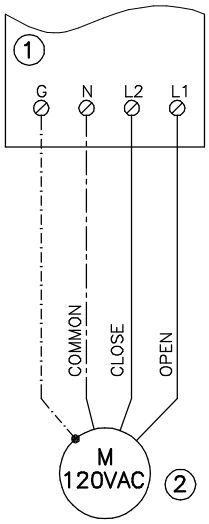
Connection of modulating valve actuators



① 120V or 24V valve adaptor

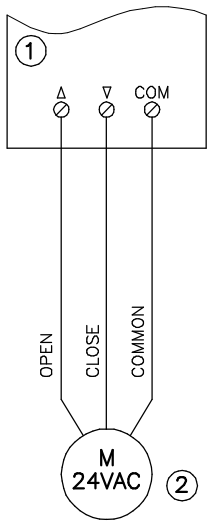
② DIN rail in connection enclosure

③ 156 Terminals



① 120V valve adaptor

② 120V valve actuator



① 24V valve adaptor

② 24V valve actuator

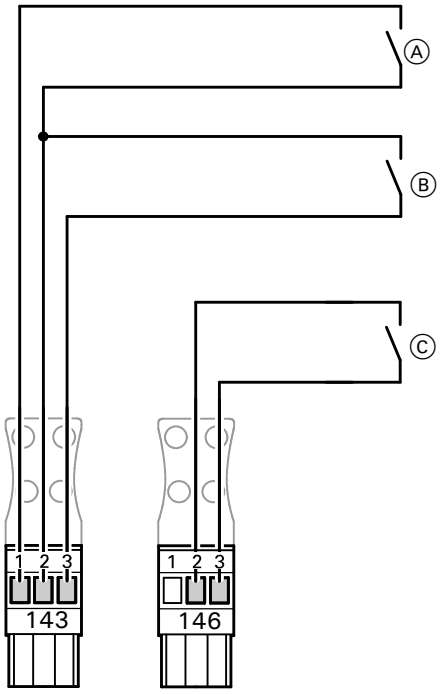
120V Valve Adaptor
Rated voltage: 120 VAC
Rated current: max. 0.1 FLA
Recommended connection
wire size: AWG 14
Part No. 7134 560

24V Valve Adaptor
Rated voltage: 24 VAC
Rated current: max. 0.15 FLA
Recommended connection
wire size: AWG 14
Part No. 7134 559

Operating time:
5 to 199 sec. selected via coding address “40”.

1. Disconnect power to control.
2. Install 120V or 24V valve adaptor on DIN rail inside connection enclosure.
3. Insert the plug 52 into socket 52 on the control.
4. Fasten cable with tie (see page 76).
5. Connect black wire of the adaptor to connection 156 on the DIN rail - Terminal 8,9 or 10.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Connection of external contacts



Ⓐ External heating program changeover/external mixing valve
Ⓑ External disable/external mixing valve "closed"
Ⓒ External override

Ⓐ External heating program changeover or mixing valve "open"

Contact closed:
The manually pre-selected heating program can be changed via this contact, (see table below) enabling the mixing valves to be opened.

The mixing valve open function can be allocated via coding address "9A", and the heating program changeover can be allocated to the heating circuits via address "91".

⚠Heating circuits are no longer frost protected during mixing valve closed. A minimum boiler return temperature is not maintained during external disabling.

Via coding address "99", you can pre-select what input 143 should affect.

Ⓑ External disable/external mixing valve "closed"

Closing the dry contact causes the burner to shut down or the mixing valve to be closed.
Allocated boiler or shunt pumps are switched OFF, and isolation valves are closed.

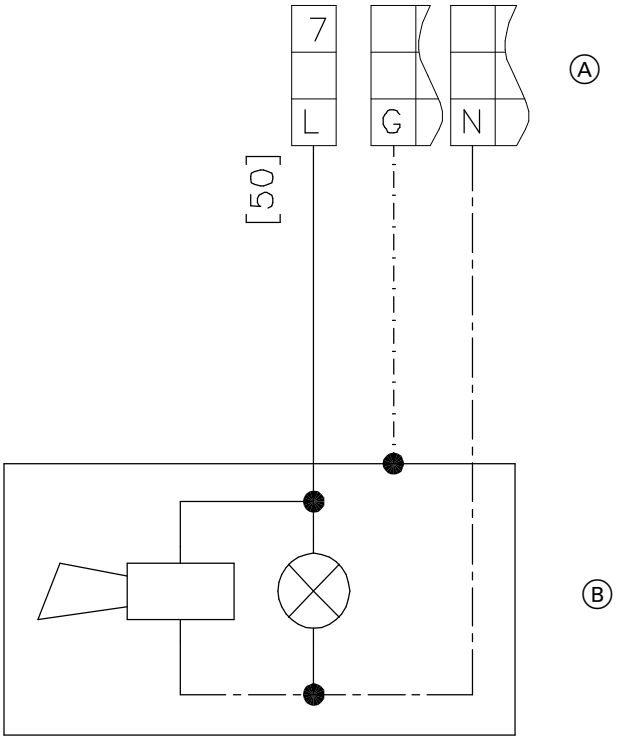
Ⓒ External demand

Closing the dry contact starts the boiler burners, subject to load via a set supply temperature (coding address "9b") on Vitocontrol-S, VD2/CT3.

The supply temperature is limited via the set min. and max. supply temperature.

Manually pre-selected heating program (with open contact)		**Coding 2**		**Changed heating program** (with closed contact)
⏻	Room heating OFF/ DHW OFF	d5: 0 (factory default)	<–>	Continuous operation with reduced room temperature/DHW OFF
or				
🚿	Room heating OFF/ DHW ON	d5: 1	<–>	Continuous operation with normal room temperature/DHW in accordance with coding address "64"
or				
🚿	Room heating ON/ DHW ON			

Connection of the compiled failure alarm



Rated voltage: 120 VAC 60 Hz
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

1. Disconnect power to control and burner.

2. Connect the compiled failure alarm as shown in the diagram.

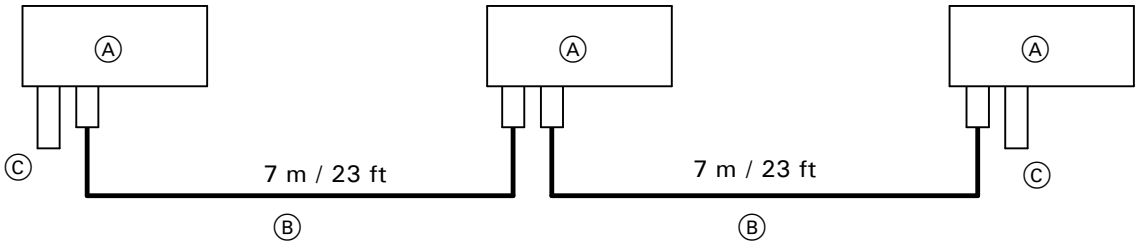
Ⓐ Connect terminal strip in connection enclosure of boiler control

Ⓑ Visual and/or audible alarm device (120 VAC)

Making the LON connection

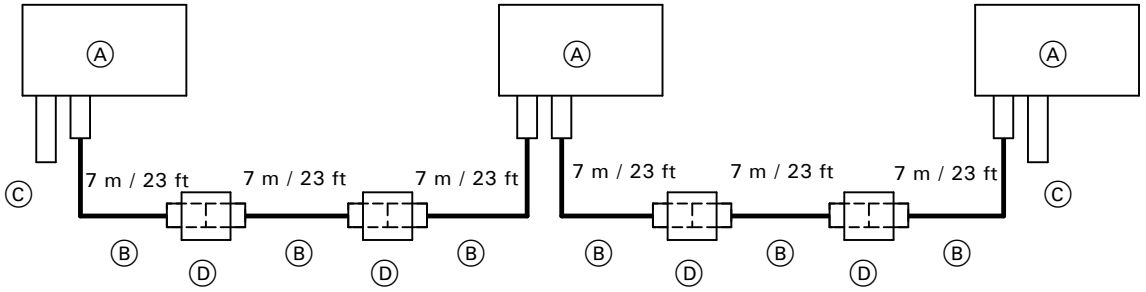
The Viessmann LON system is designed for the Line BUS topology with end of line resistors on both ends.

Connection with Viessmann LON cable



Ⓐ Control unit or Vitocom
Ⓑ LON cable, Part No. 7143 495
Ⓒ End of line resistor (standard delivery of Vitocontrol-S, VD2/CT3/CM2) Part No. 7143 497

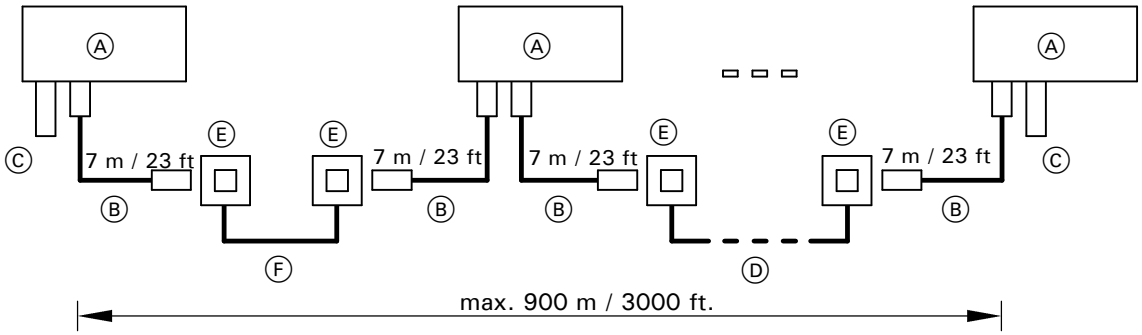
Connection with
- **Viessmann LON cable and**
- **Viessmann LON coupling**



Ⓐ Control unit or Vitocom
Ⓑ LON cable, Part No. 7143 495, (max. 3 cables between two devices)
Ⓒ End of line resistor (standard delivery of Vitocontrol-S, VD2/CT3/CM2)
Ⓓ LON extension jack, Part No. 7143 496

Making the LON connection *(continued)*

Connection with
- **Viessmann LON cable,**
- **On-site cable** for extensions up to 900 m / 3000 ft.

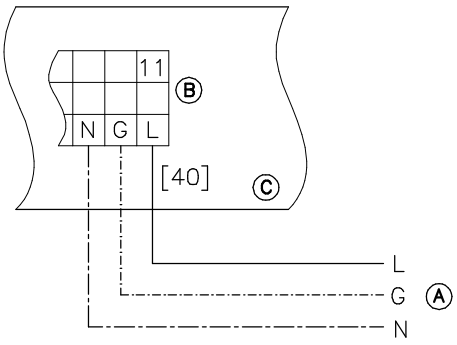


Ⓐ Control unit or Vitocom
Ⓑ LON cable, Part No. 7143 495
Ⓒ End of line resistor (standard delivery of Vitocontrol-S, VD2/CT3/CM2)
Ⓓ Up to 99 participants and the corresponding number of junction boxes and cables
Ⓔ Junction box
Ⓕ Connecting cable (on site)

Please note:
The Viessmann LON system always requires the two wires and shielding. Wires are interchangeable.

Observe the requirements for cabling and operation of the LON interface FTT-10A (see www.echelon.com).

Power supply



Legend
L: Line
N: Neutral
G: Ground

Ⓐ Power supply 120 VAC, 1PH, 60Hz, provide disconnect means and overcurrent protection as per local codes
Ⓑ Terminal [40] in connection enclosure
Ⓒ Connection enclosure

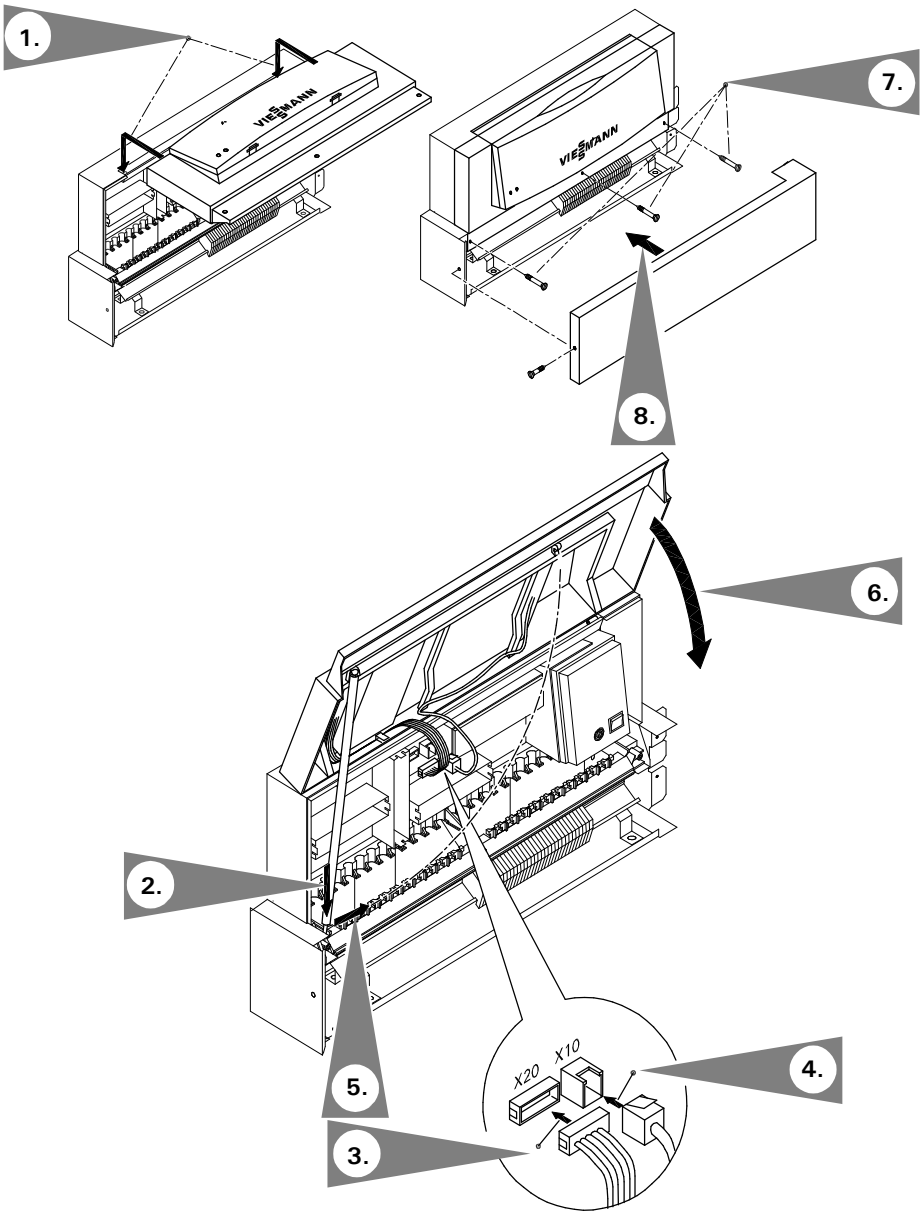
1. Ensure that the main power supply to the control contains overcurrent protection with a minimum rating of 6A and 2-pole disconnect

⚠ WARNING

The control must be grounded. Ensure that "L", "N" and "G" are not interchanged.

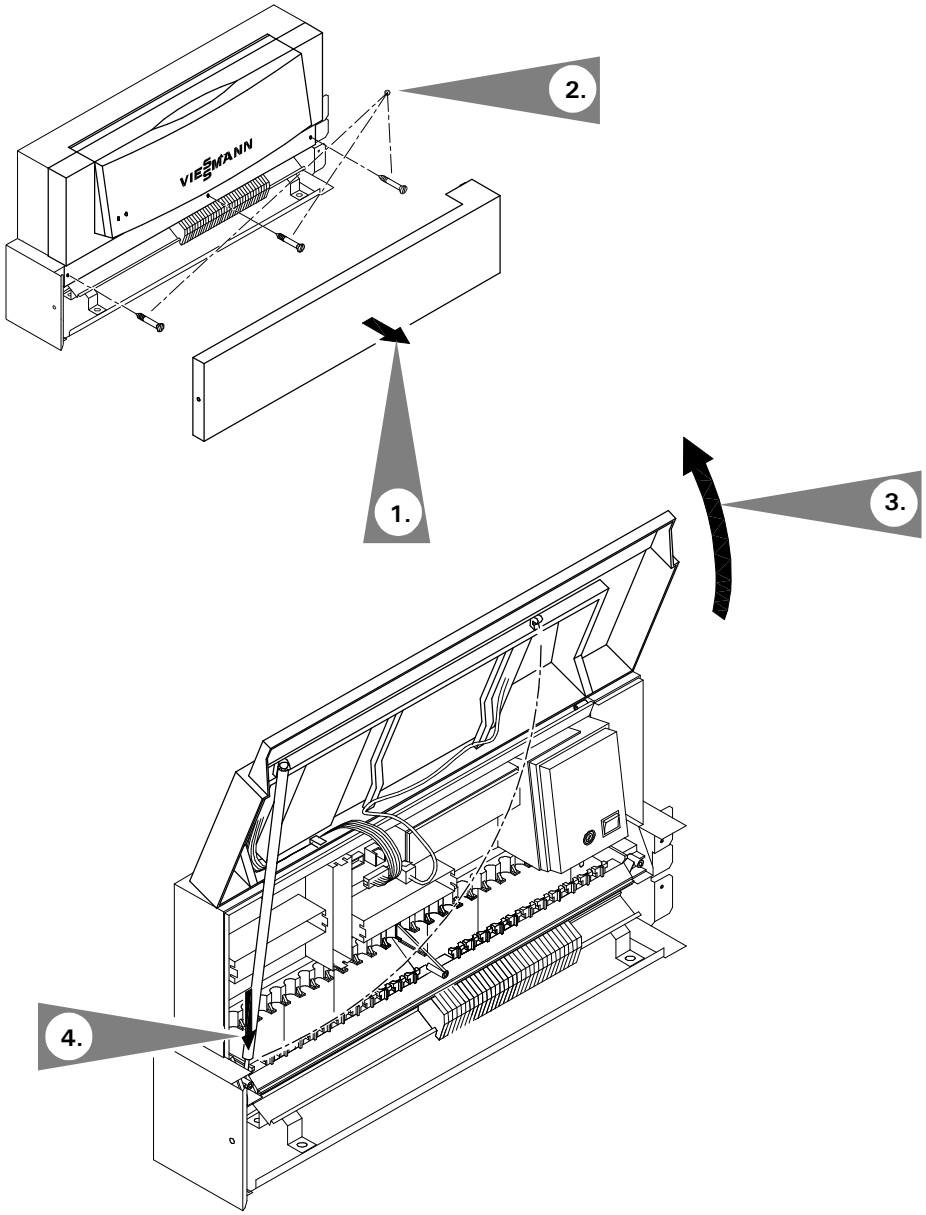
2. Connect power supply wire to the connection [40] terminals 11, N and G on the DIN rail inside the connection enclosure.

Installing the control unit front



1. Position the front part of the housing and clip hinges to counter-parts on main housing.
2. Release the stay bar, open it up and lock in position.
3. Insert the flat cable from the Optolink into plug "X20".
4. Insert the plug of the programming unit into plug "X10". Use cable guides in cover for routing.
5. Engage the stay bar in the front housing.
6. Close the front of the housing.
7. Secure front housing with supplied screws.
8. Install cover of the connection enclosure and support with supplied screw.

Opening the control unit



1. Remove the cover of the connection enclosure.
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

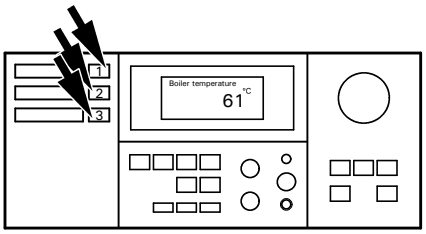
Steps

Page

1. Checking the heating circuit allocation (Vitocontrol-S, VD2/CT3/CM2) 91
2. Changing the display language selection (Vitocontrol-S, VD2/CT3/CM2, if necessary) 91
3. Checking the fixed high limit (Vitotronic 100) 91
4. Connecting control units into the LON system 92
5. Carrying out a participant check (Vitocontrol-S, VD2/CT3/CM2) 94
6. Match the coding addresses to the respective system version 95
7. Checking outputs (actuators) and sensors 98
8. Selecting the boiler sequence (Vitocontrol-S, VD2/CT3/CM2) 99
9. Adjusting the heating curve (Vitocontrol-S, VD2/CT3/CM2) 100

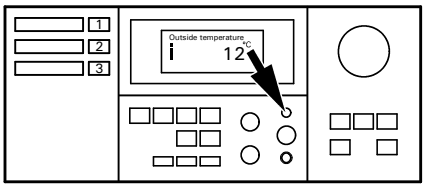
Further step-by-step instructions

Checking the heating circuit allocation (Vitocontrol-S, VD2/CT3/CM2)



- Check whether the label for heating circuit allocation has been affixed to the corresponding field of the programming unit.
- Press the corresponding button before commencing any adjustments.

Changing the display language selection (Vitocontrol-S, VD2/CT3/CM2)



1. Press ⓘ.

2. Select the required language with ⊖.

3. Confirm with OK.

Checking the fixed high limit (Vitotronic 100)

Hold down the **test button (TÜV)** during this test (in the ✋ position); a minimum supply rate must be present. The minimum boiler flow rate should be 10% of the boiler flow rate at rated output.
Reduce the heat consumption as far as possible. The adjustable high limit is now bypassed.
The burner remains switched ON until the boiler water temperature has reached the safety temperature and the fixed high limit (FHL) has switched OFF.

After the burner has been shut down by the fixed high limit,

- Release **TÜV** button , the display will show fault D4.
- Wait until the boiler water temperature has fallen 15 to 20°C / 25 to 35°F below the set safety temperature, then reset the fixed high limit by pressing button ⇧; fault D4 will clear from the display.

Further step-by-step instructions *(continued)*

Connecting control units to the LON system

The LON communication module must be plugged in (see page 44).

Please note:
Data transfer via the LON system can take several minutes.

Vitotronic 100, GC1

1. **Setting the system type**
   Set coding 1 to 01: 2.
   Coding 1, see page 154.

2. **Setting the boiler number**
   In coding 1, set the boiler number via coding address “07”.

3. **Setting the LON participant number**
   In coding 1, set the participant number via coding address “77”.

   Please note:
   In a LON system, the same number ***cannot*** *be allocated twice.*

Vitocontrol-S, VD2/CT3/CM2

1. **Setting the number of boilers**
   In coding 1, set coding address “35”.
   Coding 1, see page 164.
2. **Setting the LON participant number**
   In coding 1, set the LON participant number via coding address “77” (factory default setting 77: 5).

   Please note:
   In a LON system, the same number ***cannot*** *be allocated twice.*

Updating the LON particpant list on Vitocontrol-S, VD2/CT3/CM2

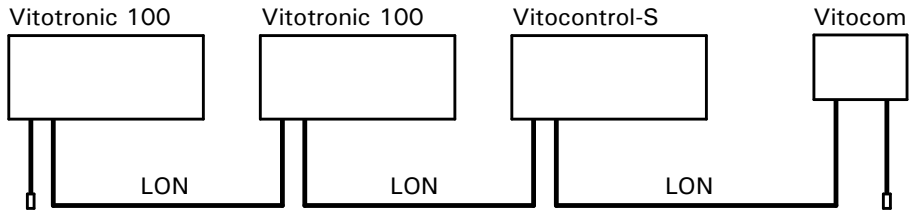
Only possible if all participants are connected and the control unit is programmed as fault manager (coding 79: 1, factory default setting)

Please note:
In each heating system, ***only one Vitotronic*** *can be encoded as fault manager.*

1. Press ↵ and OK simultaneously for approx. 2 seconds.
   The participant check is initiated (see page 94).
2. Press ⏎.
   The participant list is updated after approx. 2 minutes.
   The participant check is completed.

Further step-by-step instructions *(continued)*

Example of a multi-boiler system

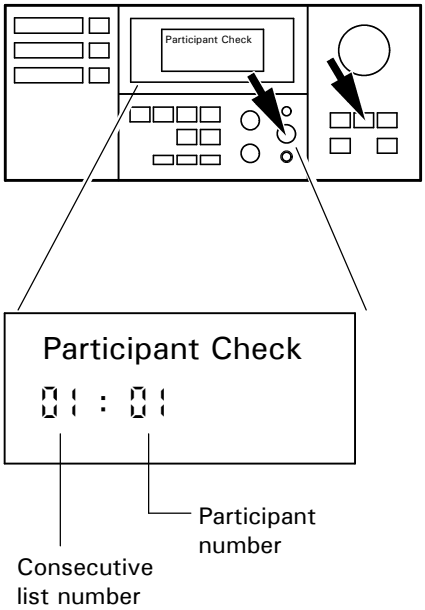


Multi boiler systems with cascade control via LON-BUS **Set** coding 01: 2	Multi boiler systems with cascade control via LON-BUS **Set** coding 0 : 2		
Participant no. 1 Coding 77: 1	Participant no. 2 **Set** coding 77: 2	Participant no. 5 Coding 77: 5	Participant no. 99
Boiler number 1 Coding 07: 1	Boiler number 2 **Set** coding 07: 2	––	––
––	––	Number of connected boilers **Set** coding 35: 2	––
Viessmann system number Coding 98: 1	Viessmann system number Coding 98: 1	Viessmann system number Coding 98: 1	––
Remote monitoring LON participant Coding 9C: 20	Fault monitoring LON participant Coding 9C: 20	Fault monitoring LON participant Coding 9C: 20	––

Further step-by-step instructions *(continued)*

Carrying out a participant check (Vitocontrol-S, VD2/CT3/CM2)

The communication with the system devices connected to the fault manager is tested with a participant check.
Preconditions:
- The control unit must be encoded as fault manager (coding 79: 1).
- The LON participant number must be encoded in all control units (see page 92).
- The fault manager participant list must be up to date (see page 92).



1. Press ↩ and OK simultaneously for approx. two seconds.
2. Select the required participant with ⊕ and ⊖.
3. Activate checking with OK.
   Check flashes until its completion. The display and all button illuminations of the selected participant flash for approx. 60 seconds.
   - **Check OK** flashes during communication between both devices.
   - **Check not OK** is displayed, if communication is not established. Check the LON connection (see page 86) and coding (see page 93).
4. For checking further participants, proceed as described under items 2 and 3.
5. Press ↩ and OK simultaneously for approx. one second.

Further step-by-step instructions *(continued)*

Matching coding addresses to respective system version

Vitotronic 100

In coding 1, set the following coding addresses:

- 01 Multi-boiler system
- 02 Burner type
- 03 Oil or gas operation
- 07 Boiler number

In coding 2, set the following coding addresses:

- 0C Return temperature control
- 0d Therm-Control
- 4C Function plug 20
- 4d Function plug 29
- 4E Function plug 52
- 77 LON participant number
- 98 Viessmann system number
- 9C LON participant monitoring

Vitocontrol-S, VD2/CT3/CM2

In coding 1, set the following coding addresses:

- 00 System design
- 35 Number of boilers in the cascade
- 36 Minimum supply temperature limit of the cascade
- 37 Maximum limit of the cascade supply temperature
- 3b Control type
- 3C Control strategy
- 40 Actuator run time
- A2 DHW priority
- A5 Heating circuit pump logic function (economy circuit)
- C5 Minimum limit of the heating circuit supply temperature
- C6 Maximum limit of the heating circuit supply temperature

In coding 2, set the following coding addresses:

- 39 Permanent lead boiler
- 3A Permanent last boiler
- 4C Function plug 20
- 4d Function plug 29
- 4E Function plug 52
- 55 Function DHW temperature control
- 77 LON participant number
- 7A Central control
- 7E Flue gas cascade
- 7F Detached house or apartment building
- 98 Viessmann system number
- 9C LON participant monitoring

Further step-by-step instructions *(continued)*

Matching the control unit to a two stage burner (Vitotronic 100, GC1)

1. Start up the burner.

2. Set the override switch to ☝.

3. Determine the maximum burner output through the fuel consumption.
Record the relevant value.

4. Set the override switch to ⟲.

5. Press ⏻ and OK simultaneously for approx. two seconds.
Relay test is activated.

6. Activate the burner stage 1 ON function with ⊕ (display shows: 4).

7. Determine the minimum burner output (basic load) through the fuel consumption.
Record the relevant value.

8. Press OK.
Relay test is completed.

9. Set the determined values in coding 1, see the table below and page 154.

Address	Setting the:
08	Units and tens of the determined maximum output; e.g. max. output: 225 kW – set here: 25 values including 199 kW can be entered directly
09	Hundreds of the determined maximum output; e.g. max. output: 225 kW – set here: 2
0A	Relationship between basic output and max. output in percent; e.g. basic output: 135 kW max. output: 225 kW $\frac{135\ kW}{225\ kW} \times 100\ \% = 60\ \%$

Further step-by-step instructions *(continued)*

Matching the control unit to a modulating burner (Vitotronic 100, GC1)

Please note:
The burner must be fully adjusted. To achieve a wide modulating range, set the minimum output as low as possible (observe the chimney and flue gas system).

1. Start up the burner.

2. Set the override switch to ☝.

3. Wait until the burner actuator is set to maximum output.

4. Determine the maximum burner output through the fuel consumption.
Record the relevant value.

5. Press ⏻ and OK simultaneously for approx. two seconds.
Relay test is activated.

6. Activate the mod. burner close function with ⊕ (display shows: 4), and set the override switch to ↻.
Check the time it takes until the actuator is at minimum output.
Record the relevant value.

7. Determine the minimum burner output (basic load) through the fuel consumption.
Record the relevant value.

8. Activate the mod. burner open function with ⊖ (display shows: 2), and set mod. burner neutral function (display shows: 3) using ⊕, after 1/3 of the time checked under item 6 (stop burner module controller).

9. Determine the partial output through the fuel consumption.
Record the relevant value.

10. Press OK.
Relay test is completed.

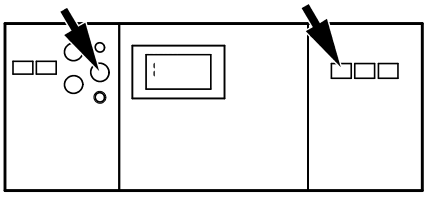
11. Set the determined values in coding 1, see the table below and on page 154.

Address	Setting of
08	Units and tens of the determined maximum output; e.g. max. output: 225 kW – set here: 25 values including 199 kW can be entered directly.
09	Hundreds of the determined maximum output; e.g. max. output: 225 kW – set here: 2
15	Determined run time in seconds
0A	Relationship between basic output and max. output in percent; e.g. basic output: 72 kW max. output: 225 kW $\frac{72\ kW}{225\ kW} \times 100\ \% = 32\ \%$
05	Relationship between partial output and max. output in percent; e.g. partial output: 171 kW max. output: 225 kW $\frac{171\ kW}{225\ kW} \times 100\ \% = 76\ \%$

Further step-by-step instructions *(continued)*

Checking outputs (actuators) and sensors

Vitotronic 100
■ Relay test

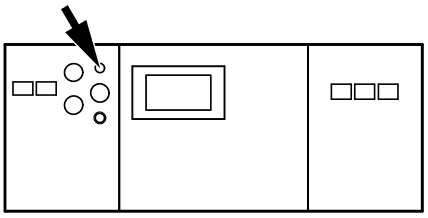


1. Press ⏻ and OK simultaneously for approx. two seconds.
2. Select the relay outputs with ⊕ or ⊖.
3. Press OK.

The following relay outputs may be selected:

Display indication	Relay function
1	Burner or stage 1 ON
2	Burner stage 1 and 2 ON or modulation up
3	Burner modulation neutral
4	Burner stage 1 ON (modulation down)
5	Output 20 ON
6	Output 29 ON
7	Output 52 open
8	Output 52 neutral
9	Output 52 close
11	Central fault message ON

■ Check sensors

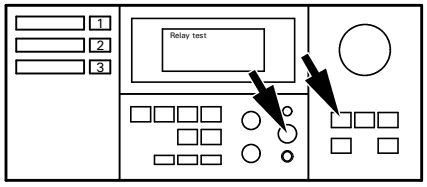


1. Press i.
   Scanning operating conditions is active, see page 106.
2. Scan the actual temperature with ⊕ or ⊖.
3. Press i.
   Scanning is completed.

Further step-by-step instructions *(continued)*

Vitocontrol-S, VD2/CT3/CM2

■ **Relay test**



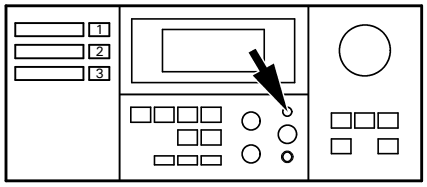
1. Press ⏻ and OK simultaneously for approx. two seconds.
2. Select the relay outputs with ⊕ or ⊖.
3. Press OK.

The following relay outputs may be selected:

- Output 20 ON
- Output 29 ON
- Output 52 open
  Output 52 ntr.
  Output 52 close
- DHW tank heating pump ON
- DHW recirculation pump ON
- Heating pump (M2) ON
- Heating pump (M3) ON
- Mixing valve (M2) open
- Mixing valve (M2) close
- Mixing valve (M3) open
- Mixing valve (M3) close
- Central fault display ON

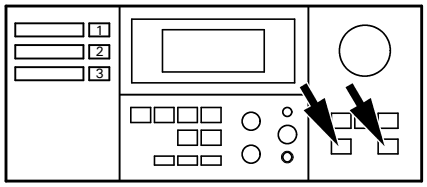
Please note:
The illuminated heating circuit selector button indicates the corresponding heating circuit.

■ **Check sensors**



1. Press i.
   Scanning operating conditions is active, see page 111.
2. Scan the actual temperature with ⊕ or ⊖.
3. Press i.
   Scanning is completed.

Selecting the boiler sequence (Vitocontrol-S, VD2/CT3)



1. If required:
   In coding 2, set coding addresses "39" (permanent lead boiler) and "3A" (permanent last boiler).
2. Press ⚙ and ⚙ simultaneously for approx. two seconds.
3. Select the required boiler sequence with ⊕ or ⊖.
   By pressing ⊕ and ⊖ simultaneously, you can exit the adjustment without saving any modifications made.
4. Press OK.
   The adjustment has been transferred.
5. In coding 2, set the coding addresses "38", "41", "42", "43" and "44", see also the function description from page 168.

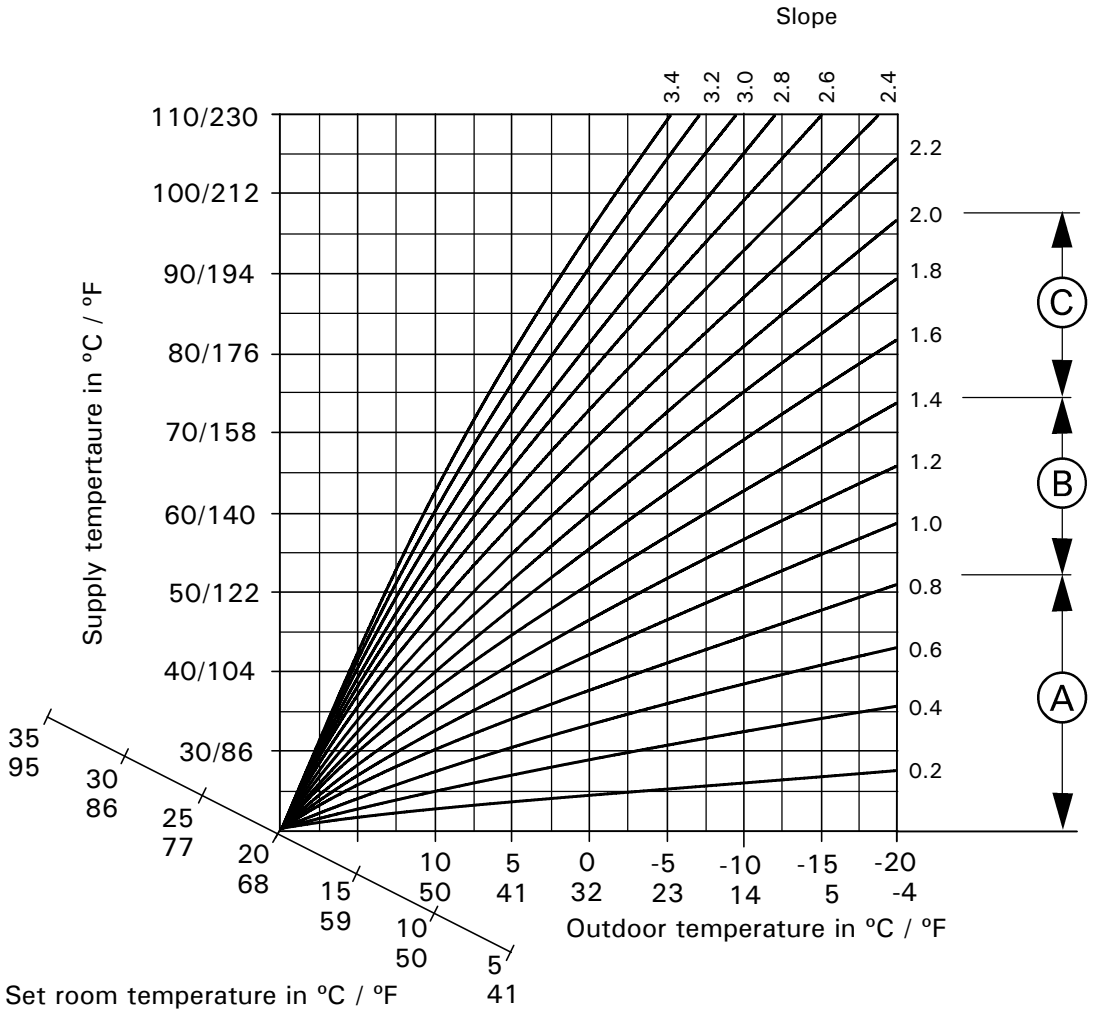
Further step-by-step instructions *(continued)*

Adjusting the heating curve (Vitocontrol-S, VD2/CT3/CM2)

The heating curves illustrate the relationship between the outdoor temperature and the boiler water or the supply temperature. To put it simply: the lower the outdoor temperature, the higher the boiler water or supply temperature. The room temperature again depends on the boiler water or the supply temperature.

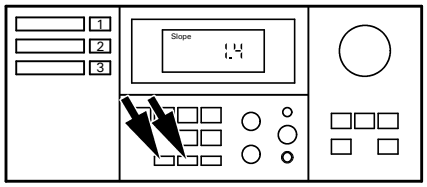
Factory default settings:
- Slope: ◺ = 1.4
- Shift: ◿ = 0

Generally, the heating curve is set:
- In range Ⓐ for underfloor heating systems,
- In range Ⓑ for low temperature heating systems (according to the Energy Savings Order),
- In range Ⓒ for heating systems with boiler water temperatures above 75°C / 167°F.



Further step-by-step instructions *(continued)*

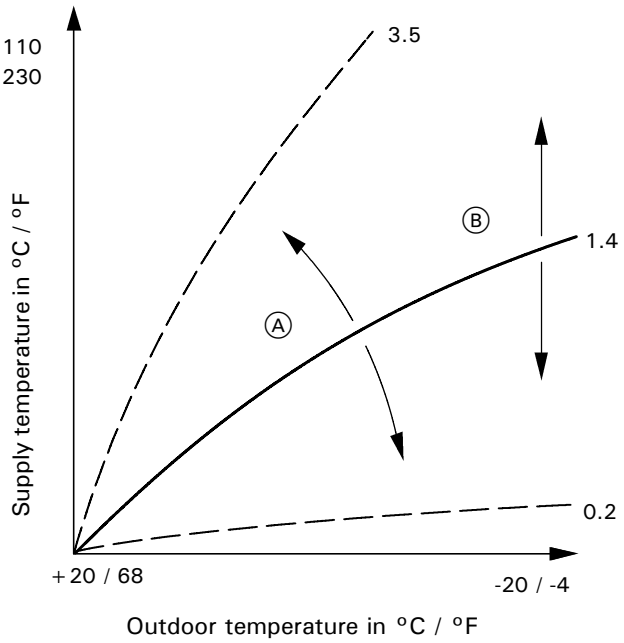
Changing slope and shift
(for every heating circuit separately)



1. Call up slope with ⩘,
adjustable value 0.2 to 3.5;
call up shift with ⩗;
adjustable value −13 to +40°C /
8.6 to 104°F.

2. Change the value with ⊕ or ⊖.

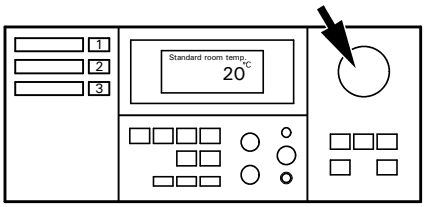
3. Confirm the set value with OK.



Ⓐ Change slope
Ⓑ Change shift

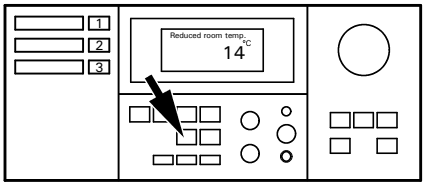
Further step-by-step instructions *(continued)*

Adjusting the normal room temperature
(for every heating circuit separately)



Normal room temperature:
Select the normal day temperature with the set value adjuster.

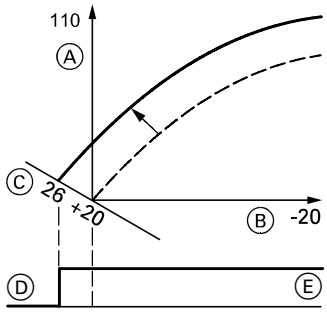
The value will be automatically transferred after approx. 2 seconds.

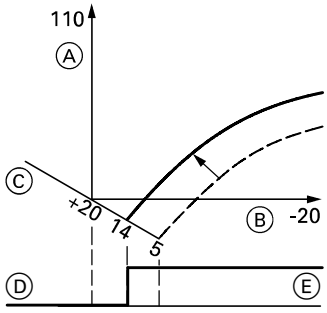


Reduced room temperature:
1. Call up the reduced night temperature with ☾.

2. Change the value with ⊕ or ⊖.

3. Confirm the set value with OK.





Temperature conversion:

°C	°F
-20	-4
5	41
14	57
20	68
26	79
110	230

Example 1:
Adjustment of the normal room temperature from 20 to 26°C / 68 to 79°F.

Example 2:
Adjustment of the reduced room temperature from 5 to 14°C / 41 to 57°F.

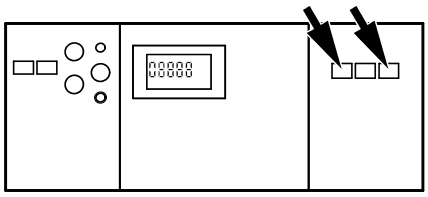
Ⓐ Boiler water temperature or supply temperature in °C / °F
Ⓑ Outdoor temperature in °C / °F
Ⓒ Set room temperature in °C / °F
Ⓓ Heating circuit pump OFF
Ⓔ Heating circuit pump ON

Accordingly, the heating curve is adjusted along the set room temperature axis, resulting in modified start/shutdown characteristics for the heating circuit pumps, if the heating circuit pump logic is active.

Service level summary

Function	Entry	Exit	Page
Relay test	Press the ⏻ and "OK" buttons simultaneously for approx. 2 seconds	Press the "OK" button	98
Temperatures, boiler coding card and quick scans	Press the ⏻ and 🛁 buttons simultaneously for approx. 2 seconds	Press the "OK" button	104
Operating conditions	Press the ⓘ button	Press the ⓘ button	106
Maintenance requirement indication		Press the "OK" button	107
Call up acknowledged maintenance notifications	Press the "OK" button for approx. 2 seconds	Press the "OK" button	107
Troubleshooting		Press the "OK" button	113
Call up acknowledged fault notifications	Press the "OK" button for approx. 2 seconds	Press the "OK" button	113
Fault history	Press the 🛁 and "OK" buttons simultaneously for approx. 2 seconds	Press the "OK" button	116
Resetting codings to the factory settings	Press the 🚿 and 🛁 buttons simultaneously for approx. 2 seconds, press ⨯	––	153
Coding 1	Press the ⏻ and 🚿 buttons simultaneously for approx. 2 seconds	Press the ⏻ and 🚿 buttons simultaneously for approx. 1 second	154
Coding 2	Press the 🚿 and 🛁 buttons simultaneously for approx. 2 seconds	Press the 🚿 and 🛁 buttons simultaneously for approx. 1 second	156

Temperatures, boiler coding card and quick scans



1. Press ⏻ and 🚿 simultaneously for approx. two seconds.
2. Select the required scan with ⊕ or ⊖.
3. Press OK.

Subject to the system equipment level, the following values can be scanned:
(for scans, see table below):

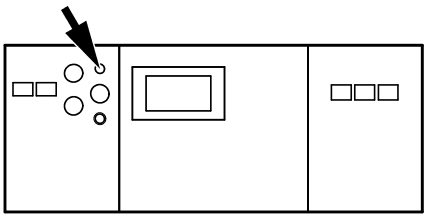
Display indication	Explanation	Notes
00000	Scan 0	––
10000	Scan 1	––
20000	Scan 2	––
3 65 °C	Set boiler water temperature	Effective set value including boiler protection
4 000	Scan 4	––
8 230 °C	Maximum flue gas temperature	See coding address “1F”; can be reset to the actual value with ✻
C 1010	Boiler coding card	––
b 000	Scan b/d	––
L 000	Scan L	––
d0000	Scan d	––

Temperatures, boiler coding card and quick scans *(continued)*

Scans

8	8	8	8	8	8
0	**N/A**	LON participant number		Software version – communication co-processor	SNVT configuration 0 = Auto 1 = Tool
1	**N/A**	Subnet address/system number		Node address	
2	**N/A**	Number of LON participants		Software version – LON communication module	
4	**N/A**	N/A	System design 1 or 2; Display according to the coded system, see page 156	Software version – programming unit	Software version – control unit
b	**N/A**	N/A	Burner 0 = OFF 1 = Stage 1/basic load 2 = Stage 2/ full load	d	isolation valve 0 = OFF 1 = Pre-heating 2 = Control close 3 = Control 4 = Control open 5 = Open 6 = Time delay
L	**N/A**	N/A	Output reduction 0 = OFF; 1 to 100 %		
o	**N/A**	Equipment recognition hexa-decimal: A0 decimal: 160		Test code for Viessmann service technicians	

Scanning operating conditions



1. Press ⓘ.

2. Select the required operating condition scan with ⊕ or ⊖.

3. Press ⓘ.

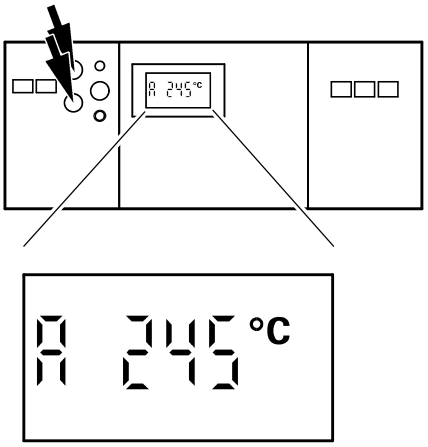
The following values can be scanned subject to the actual system layout:

Display indication	Explanation	Notes
0 01	LON participant number	––
3 65 °C	Boiler temperature	––
5 55 °C	Temperature at sensor "17A"	Only with Therm-Control temperature sensor or with temperature sensor T1
8 190 °C	Flue gas temperature	Only with flue gas temperature sensor
9 60 °C	Temperature at sensor "17B"	Only with temperature sensor T2
▲ 06357 h	Burner run hours Stage 1	The run hours can be reset to 0 with ⊁. The run hours displayed are only approximate values
▲▲ 00957 h	Burner run hours Stage 2	
▲▲▲ 03041	Burner starts	The burner starts can be reset to 0 with ⊁
▲▲▲▲ 030505	Consumption	When set via coding address 26 or 29 (only with two-stage burner) the burner starts can be reset to 0 with ⊁
▲▲▲▲▲ 00141 h	Solar pump run hours	Only in connection with a solar system
▲▲▲▲▲▲ 002850	Solar energy in kWh	Only in connection with a solar system

Scanning and resetting maintenance displays

After limits have been reached, which were set up via coding addresses "1F", "21" and "23" (see page 159), the programming unit display flashes one of the following messages.

Please note:
Set coding 24: 1 and then coding 24: 0, if maintenance is implemented before a maintenance message is displayed; the set maintenance parameters for run hours and periods are then reset to 0.

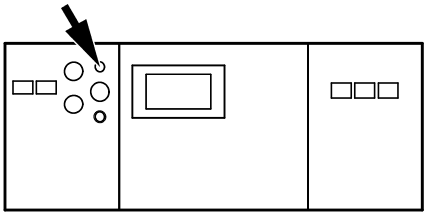


Display indication	Explanation
A 245 °C	Max. flue gas temperature has been reached
3510 h	Burner run hours have been reached
12	Time interval (e.g. 12 months) has been reached

1. Scan maintenance messages with ⊕ or ⊖.
2. Press OK.
   The maintenance indication in the display is cleared.

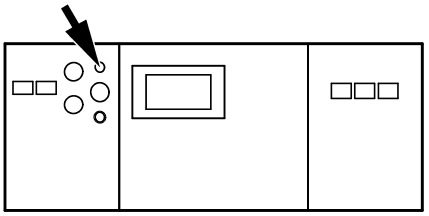
   Please note:
   An acknowledged maintenance message can be redisplayed by pressing OK (approx. three seconds).

After maintenance has been carried out



1. Reset coding 24: 1 (see page 160) to 24: 0.

   Please note:
   If coding address 24 is not reset, a new maintenance message will be displayed on Monday morning.



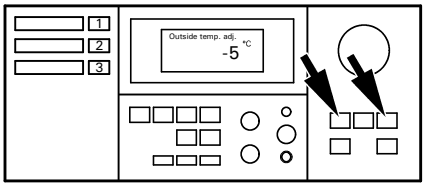
2. If required:
   - Press i
   - Reset burner run hours and burner starts with ⏀ (see page 106)
   - Press i

3. If required:
   - Press ⏻ and 🌡🚿 simultaneously for approx. four seconds
   - Reset maximum flue gas temperature (🌡) with ⏀ (see page 104)
   - Press OK

Service level summary

Function	Entry	Exit	Page
Adjusting display contrast	Press the "OK" and "+" buttons simultaneously; the display will darken	––	––
	Press the "OK" and "-" buttons simultaneously; the display will get lighter	––	––
Participant check	Press the and "OK" buttons simultaneously for approx. 2 seconds	Press the and "OK" buttons simultaneously for approx. 1 sec	94
Relay test	Press the and "OK" buttons simultaneously for approx. 2 seconds	Press the "OK" button	99
Boiler sequence	Press the and buttons simultaneously for approx. 2 seconds	Press the "OK" button	99
Temperatures and quick scans	Press and simultaneously for approx. 2 seconds	Press the "OK" button	109
Operating status	Press the ⓘ button	Press the ⓘ button	111
Maintenance requirement indication	ⓘ (if maintenance flashes)	Press the "OK" button	112
Troubleshooting	Press the ⓘ button	Press the "OK" button	116
Error history	Press the and "OK" buttons simultaneously for approx. 2 seconds	Press the "OK" button	122
Resetting codings to factory default settings	Press the and buttons simultaneously for approx. 2 seconds; press the button; confirm by pressing the "OK" button	––	163
Coding 1	Press and simultaneously for approx. 2 seconds	Press the and buttons simultaneously for approx. 1 sec	164
Coding 2	Press the and buttons simultaneously for approx. 2 seconds; confirm by pressing the "OK" button	Press the and buttons simultaneously for approx. 1 sec	167

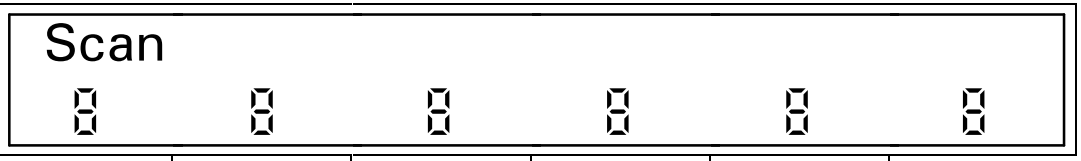
Temperatures and quick scans



1. Press ⏻ and simultaneously for approx. 2 seconds.
2. Select the required scan with ⊕ or ⊖.
3. Press OK

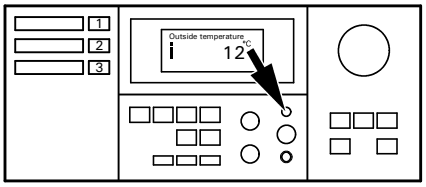
The following values can be scanned subject to the actual equipment level:

- Slope, shift A1, M2, M3
- Outdoor temperature dampened → The dampened outdoor temperature can be reset to the actual outdoor temperature with ⏭
- Actual outdoor temperature
- Boiler sequence
- Actual % output boiler 1 to 4 → Boiler output – actual value
- Output red. %
- Integral → at –1 to –100 start-up integral in percent; at 1 to 100 shutdown integral in percent (▲ – arrow above the word, when the integral increases)
- Actual boiler temp. boiler 1 to 4
- Sensor 17A actual → Display only if a sensor is connected
- Sensor 17B actual
- Flue gas temp. max
- Flue gas temp. actual
- Set DHW temp.
- Actual DHW temp. → Display only if a DHW tank sensor is connected
- Actual DHW temp. 1 → Display only if two DHW tank temperature sensors are connected
- Actual DHW temp. 2
- Set supply temp.
- Actual supply temp. → Display only if a supply temperature sensor is connected
- Actual return temp. → Display only if a return temperature sensor is connected
- Set room temp.
- Actual room temp. → Display only if a remote control unit is installed
- Scan 1 to Scan 9 → Scans 1 to 9, see page 110



Scan						
1	Display acc. to system designs (see coding address 00)		N/A	Number of KM BUS participants	N/A	N/A
2	Software version control unit	Software version programming unit	Software version mixing valve extension M2 Printed Circuit Board	N/A	Software version mixing valve extension M3 Printed Circuit Board	Software version Plug-in adaptor for ext. safety equipment
3	Operating mode sys. circuit A1 0 w/o remote control 1 with Vitotrol 200 2 with Vitotrol 300	Software version remote control system circuit A1	Operating mode mixing valve circuit M2 0 w/o remote control 1 with Vitotrol 200 2 with Vitotrol 300	Software version remote control mixing valve circuit M2	Operating mode mixing valve circuit M3 0 w/o remote control 1 with Vitotrol 200 2 with Vitotrol 300	Software version remote control mixing valve circuit M3
4	N/A					
5	LON participant number		Subnet address/system number		Node address	
6	SNVT configuration 0 = Auto 1 = Tool	Software version communication co-processor	Software version neuron chip		Number of LON participants	
7	Device identification hexa-decimal: b8 / decimal: 184		N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	Maximum system design temperature		
9	N/A	N/A	N/A	N/A	N/A	Software version Solar control

Scanning operating conditions



1. Press (i).
2. Select the required scan with ⊕ or ⊖.
3. Press (i).

The following values can be scanned subject to the actual equipment level:

- Participant number → If a holiday program has been entered
- Holiday program with departure and return date
- Holiday program active → If a central holiday program is active

- Outdoor temperature
- Boiler sequence
- Common supply temperature
- Boiler temp. 1 to 4 → Actual value boilers 1 to 4
- Sensor 17A → Display only if a sensor is connected
- Sensor 17B
- Flue gas temperature
- DHW temperature → Display only if a DHW tank sensor is connected
- DHW temperature 1 → Display only if two DHW tank
- DHW temperature 2 temperature sensors are connected

- Supply temperature → Display only in conjunction with
- Return temperature mixing valve circuits
- Set room temperature
- Room temperature → Display only if a remote control unit is installed

- Solar DHW temperature → In connection with a solar system
- Collector temperature → In connection with a solar system
- Solar energy (kWh) → In connection with a solar system

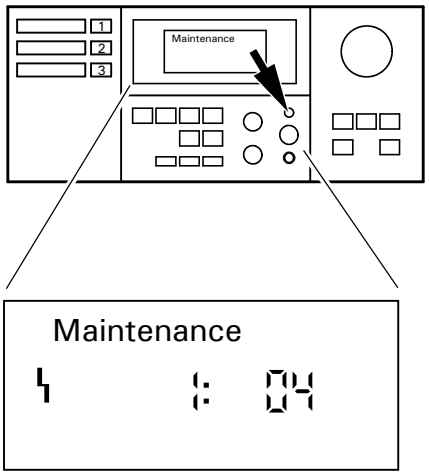
- Time
- Date
- Output 20 ON/OFF → Position detail in %
- Output 29 ON/OFF
- Output 52 open/close
- DHW tank heating pump ON/OFF
- DHW recirculation pump ON/OFF → Position detail in %.
- Heating pump ON/OFF

- Solar pump (ON/OFF) → In connection with a solar system
- Solar pump, run hours → In connection with a solar system

- Mixing valve open/closed → Each language can be selected as
- Languages permanent display language with (OK)

Scanning and resetting maintenance display

Vitocontrol-S, VD2/CT3/CM2 displays a maintenance message if:
- Vitocontrol-S, VD2/CT3/CM2 has been encoded as fault manager (coding 79: 1) and
- a maintenance message is displayed at a connected Vitotronic 100, GC1.



ϟ Fault symbol
1 Consecutive number (1 to 0)
04 LON participant number

1. Press (i).

2. Scan maintenance messages with (+) or (−).

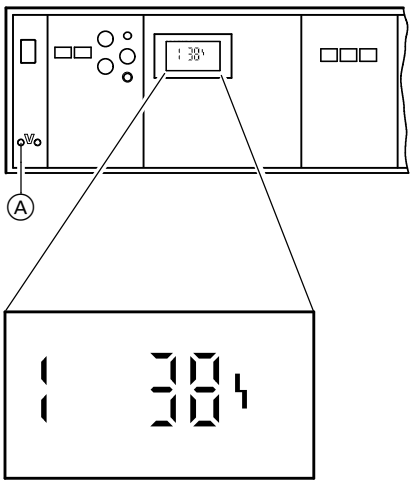
3. Press (OK).
   Display reads Acknowledge: Yes
   Confirm with (OK).
   The maintenance message in the display is cleared.

   Please note:
   An acknowledged maintenance message can be re-displayed by pressing (OK) (approx. 3 seconds).

4. Acknowledge the maintenance display at the appropriate Vitotronic 100, GC1, see page 107.

Please note:
If coding address 24 on Vitotronic 100, GC1 is not reset after the maintenance has been carried out, maintenance will be re-displayed the following Monday morning at both control units

Faults displayed at the programming unit



1 Consecutive fault number
38 Fault code
4 Fault symbol

Red fault lamp Ⓐ flashes for all faults. A fault code flashes in the display if a fault message has been issued (see page 114).

Call up further fault codes with ⊕ or ⊖.
A fault can be acknowledged with OK. The fault message in the display will be hidden, but red fault lamp Ⓐ continues to flash. A central fault messaging device connected to plug 50 will be switched OFF.
The fault message will be re-displayed if an acknowledged fault message has not been removed by the following morning.

Calling up acknowledged fault messages
Press OK for approx. 2 seconds. The fault will then be displayed. Select the acknowledged fault with ⊕ or ⊖.

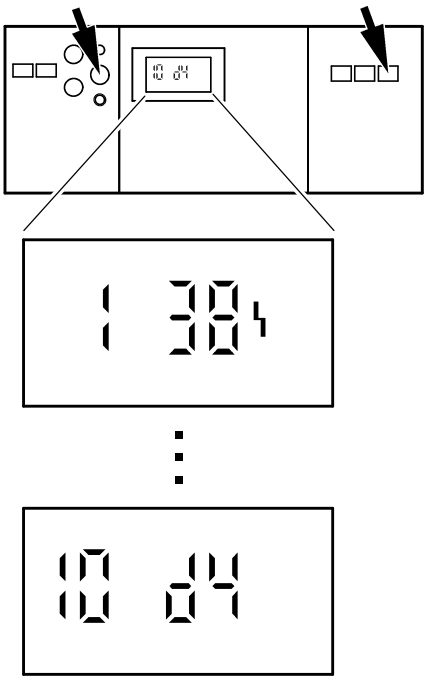
Faults displayed at the programming unit *(continued)*

Fault code	System characteristics	Cause	Remedy
0F	Control mode	Maintenance 0F is only displayed in the error history	Carry out maintenance ***Please note:*** *After maintenance, set coding 24: 0.*
30	Burner is started and stopped via an adjustable high limit	Short circuit Boiler temperature sensor	Check boiler temperature sensor
38		Open circuit Boiler temperature sensor	
60	Boiler with maximum temperature, no output reduction; return control open.	Short circuit Temperature sensor 17 A	Check temperature sensor. Set coding 4A: 0, if **no** sensor is connected.
68		Open circuit Temperature sensor 17 A	
70	Shunt pump constantly ON	Short circuit Temperature sensor 17 B	Check temperature sensor. Set coding 4b: 0, if **no** sensor is connected.
78		Open circuit Temperature sensor 17 B	
AA	Control mode	Therm-Control configuration error Plug 17 A of Therm-Control temperature sensor not plugged-in	Insert plug 17 A coding 0d: 0 must be set for Vitocrossal
AC	Control mode	Return temperature control configuration error: Coding OC: 1 has been set, but plug 17 A not plugged-in and/or coding 4E: 0 not set	Insert plug 17 A and check coding
Ad		Isolation valve configuration error: Coding OC: 2, OC: 3 or OC: 4 set, and coding 4E: 1 not set	With isolation valve: Set coding 4E: 0 Without isolation valve: Set coding 0C: 0 or 0C: 1
b0		Short circuit Flue gas temperature sensor	Check flue gas temperature sensor.
b1		Communication error – programming unit	Check connections and replace programming unit if necessary
b4	Emissions test mode	Internal electronics fault	Check Printed Circuit Board or replace if necessary
b5	Control mode		
b6	Constant mode	Invalid hardware recognised	Set coding 92: 160
b7	Boiler is regulated by adjustable high limit	Internal error – boiler coding card	Plug in boiler coding card or replace if faulty (see page 38)

Faults displayed at the programming unit *(continued)*

Fault code	System characteristics	Cause	Remedy
68	Control mode	Flue gas temperature sensor open circuit	Check flue gas temperature sensor
6F		Incorrect LON communication module	Replace communication module (see page 136)
C1	Boiler cools down	External safety device	Check connection on plug 150 and external safety equipment
C4	Control mode	Input Module 0 to 10V incorrectly connected	Connect Input Module 0 to 10 V to Vitocontrol-S, VD2/CT3 and set coding 9d: 0 on Vitotronic 100
C8	Boiler cools down	Error Low water cut off device	Check water level of system; reset low water cut-off device (see page 43)
C9		Error Maximum pressure limiter	Check system pressure; reset maximum pressure limiter
CA	Boiler cools down	Error Minimum or maximum pressure limiter 2	Check system pressure; reset minimum or maximum pressure limiter
Cb	Boiler cools down	Error External fixed high limit or temperature limiter	Check system temperature; reset fixed high limit (see page 34)
CE	Control mode	Communication error Plug-in adaptor for external safety equipment	Check plug-in adaptor for external safety equipment and connecting cable Without plug-in adaptor: Set coding 94: 0
CF		Error LON communication module	Replace communication module (see page 136)
d1	Boiler cools down	Burner fault	Check burner
d4		Fixed high limit has responded or fuse F2 has blown	Check fixed high limit or burner, burner loop and fuse F2 (see page 34)
d6	Control mode	Fault in plug-in adaptor for external safety equipment: ■ To DE1	Check electrical connections on DE1 to DE3
d7		■ To DE2	
d8		■ To DE3	

Viewing fault codes from the fault memory (error history)



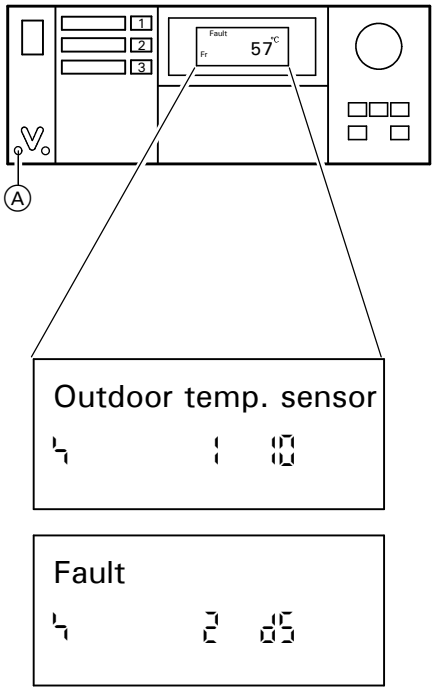
1. Press and OK simultaneously for approx. 2 seconds.
2. Call up the individual fault codes with ⊕ or ⊖.

Order of fault codes occurred	Fault code
1	Last fault code
⋮	⋮
10	10th last fault code

All saved fault codes can be deleted with ⋔.

3. Press OK.

Faults displayed at the programming unit



Red fault indicator Ⓐ flashes for all faults.

If a fault message is recognized, the display flashes Fault.

Finding the fault

1. Press i.
2. Call up further fault codes with ⊕ or ⊖.
   The fault can be acknowledged with OK. The fault message in the display will be hidden, but red fault lamp Ⓐ continues to flash. A new fault message will be displayed if an acknowledged fault is not removed by the following morning.
   A central fault messaging device connected to plug 50 will be activated.

Fault symbol
Consecutive number (1 to 10)
Fault code (for explanations see from page 117)

Faults displayed at the programming unit *(continued)*

Fault display in plain text
- Ext. fault
- Outdoor temperature sensor
- Supply sensor
- Boiler 1 to 4
- DHW tank sensor (1 or 2; display only, if a second DHW tank temperature sensor is connected)
- Return sensor
- Sensor 17A
- Sensor 17B
- Room temperature sensor
- Flue gas sensor
- Collector sensor
- Solar DHW sensor
- Participant No.
- Participant fault (display only if control unit is programmed as fault manager)

Calling up acknowledged fault messages
Press OK for approx. 3 seconds. The fault will then be displayed.
Select the acknowledged fault with ⊕ or ⊖.

Fault code	System characteristics	Cause	Remedy
0F	Control mode	Maintenance "0F" is only displayed in error history	Carry out maintenance ***Please note:*** *After maintenance, set coding 24: 0*
10	Activates after 0°C / 32°F outdoor temperature	Short circuit Outdoor temperature sensor	Check outdoor temperature sensor (see page 143)
18		Open circuit Outdoor temperature sensor	
20	Vitocontrol-S, VD2/CT3/CM2 controls in a stand-alone manner w/o supply temperature sensor (supply temperature may not be high enough)	Short circuit Common supply temperature sensor	Check common supply temperature sensor (see page 142)
28		Open circuit Common supply temperature sensor	
40	Mixing valve closes	Short circuit Supply temperature sensor of mixing valve circuit M2	Check supply temperature sensor (see page 142)
44		Short circuit Supply temperature sensor of mixing valve circuit M3	
48		Open circuit Supply temperature sensor of mixing valve circuit M2	

Faults displayed at the programming unit *(continued)*

Fault code	System characteristics	Cause	Remedy
4C		Open circuit Supply temperature sensor of mixing valve circuit M3	
50	DHW tank heating pump ON: Set boiler temperature = set DHW tank temperature, priority is cancelled or With DHW tank heating system: DHW tank heating is started and stopped by DHW tank temperature sensor 2	Short circuit DHW tank temperature sensor 1	Check DHW tank temperature sensor (see page 141)
51	With DHW tank heating system: DHW tank heating is started and stopped by DHW tank temperature sensor 1	Short circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 141)
58	DHW pump ON: Set boiler temperature = set DHW tank temperature, priority is cancelled or With DHW heating: DHW heating is started and stopped by DHW tank temperature sensor 2	Open circuit DHW tank temperature sensor 1	
59	With DHW heating: DHW heating is started and stopped by DHW tank temperature sensor 1	Open circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 141)
60	Boiler with maximum temperature, no output reduction; return control open.	Short circuit Temperature sensor 17 A	Check temperature sensor (see page 142), Set coding 4A: 0, if no sensor is connected.
68		Open circuit Temperature sensor 17 A	
70	Shunt pump constantly ON With DHW heating: Mixing valve primary circuit closed, no DHW heating	Short circuit Temperature sensor 17 B	Check temperature sensor (see page 142), Set coding 4b: 0, if no sensor is connected
78		Open circuit Temperature sensor 17 B	

Faults displayed at the programming unit *(continued)*

Fault code	System characteristics	Cause	Remedy
92	Control mode Only solar control unit fault codes will be displayed	Short circuit Collector temperature sensor	Check solar control unit sensor
93		Short circuit Collector return temperature sensor	
94		Short circuit DHW tank temperature sensor	
98		Open circuit Collector temperature sensor	
96		Open circuit Collector return temperature sensor	
9C		Open circuit DHW tank temperature sensor	
9F		Error Solar control unit; displayed if an error without fault code occurs at solar control unit	Check solar control unit
Ab	Controlled operation, possibly DHW tank cold	DHW heating configuration error: Coding 55: 3 has been set, but [17][B] not plugged-in and/or coding 4C: 1 and 4E: 1 not set	Insert plug [17][B] and check coding
AC	Control mode	Return temperature control configuration error: Coding 0C: 1 has been set, but [17][A] not plugged-in and/or coding 4E: 0 not set	Insert plug [17][A] and check coding
b1		Communication error Programming unit	Check connections and replace programming unit if necessary
b4	Emissions test mode	Internal electronics fault	Check Printed Circuit Board and replace if necessary
b5	Control mode		
b6	Constant mode	Invalid hardware recognised	Check coding address 92 (92: 184)
bA	Mixing valve closed	Communication error Mixing valve extension Printed Circuit Board	Check Printed Circuit Board and replace if necessary

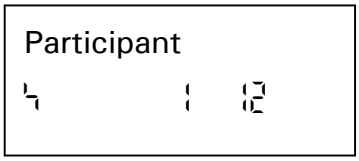
Faults displayed at the programming unit *(continued)*

Fault code	System characteristics	Cause	Remedy
bC	Control mode without remote control	Communication error Vitotrol remote control, System circuit A1	Check connections, cable, coding address "A0" and remote control DIP switches
bd		Communication error Vitotrol remote control, Mixing valve circuit M2	
bE		Communication error Vitotrol remote control, Mixing valve circuit M3	
bF	Control mode	Incorrect LON communication module	Replace communication module (see page 141)
C2		Open circuit KM BUS to solar control unit	Check KM BUS cable and solar control unit Without solar control unit: Set coding 54: 0
C4		Faulty communication with Input Module 0 to 10 V	Check connections and cables/leads; replace Input Module, if required (see page 153) Without Input Module: Set coding 9d: 0
CE	Control mode	Communication error Plug-in adaptor for external safety equipment	Check plug-in adaptor for external safety equipment and cables/leads Without plug-in adaptor: Set coding 94: 0
CF		Error LON communication module	Replace communication module (see page 141)
d5	Boiler drives up to electronic maximum limit	Boiler does not log in at cascade	Check communication (e.g. participant check), cables to Vitotronic 100 and coding (see from page 92)
d6	Control mode	Fault at DE1 in plug-in adaptor for external safety equipment ■ To DE1	Check electrical connections on DE1 to DE3
d7		■ To DE2	
d8		■ To DE3	

Faults displayed at the programming unit *(continued)*

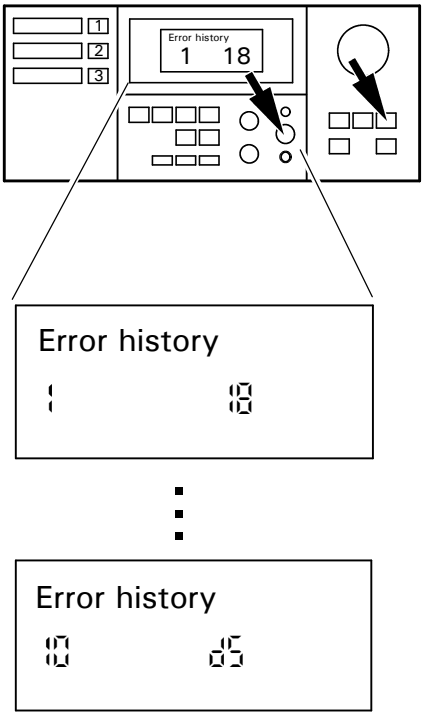
Fault code	System characteristics	Cause	Remedy
dA	Control mode without room influence	Short circuit Room temperature sensor, System circuit A1	Check room temperature sensor and DIP switch on Vitotrol (see page 146 and 148)
db		Short circuit Room temperature sensor, Mixing valve circuit M2	
dC		Short circuit Room temperature sensor, Mixing valve circuit M3	
dd		Open circuit Room temperature sensor, System circuit A1	
dE		Open circuit Room temperature sensor, Mixing valve circuit M2	
dF		Open circuit Room temperature sensor, Mixing valve circuit M3	

Fault notifications LON Participants



Fault code	System characteristics	Cause	Remedy
01 to 98	Control mode	Particpant 12, (Vitotronic 200-H) has a fault	Read fault code of participant. (See instruction manual of the applicabble control)
		No connection to participant	-Check codings -Check LON connections -Refresh participant list -Carry out a participant check
99		Remote connection to Vitocom 300 active	Check external connections to Vitocom 300
		No connection to Vitocom 300	-Check codings -Check LON connections -Refresh participant list -Carry out a participant check

Viewing fault codes from the fault memory (error history)



1. Press ⧈ and OK simultaneously for approx. 2 seconds.
2. Call up the individual fault codes with ⊕ or ⊖.

Order of fault codes occurred	Fault code
1	Last fault code
⋮	⋮
10	10th last fault code

All saved fault codes can be deleted with ⧓.

3. Press OK.

Boiler temperature control

Brief description

The boiler water temperature is regulated by controlling a two stage or modulating burner.
The set boiler water temperature set-point is controlled by Vitocontrol-S, VD2/CT3/CM2.

Coding addresses which influence the boiler temperature control
02 to 06, 08 to 0b, 13 to 1C.
For a description, see the coding overview.

Functions

The boiler water temperature is monitored by three sensors separately, which are inserted into a multiple sensor well:
- Fixed high limit (FHL) (liquid expansion)
- Adjustable high limit (AHL) (liquid expansion)
- Boiler temperature sensor KTS (changes in resistance PT500)

Control range limits top:
- Fixed high limit (FHL) 110°C / 230°F, adjustable to 99°C / 210°F
- Thermostat (AHL) 95°C / 203°F, adjustable to 87 or 100°C / 187 or 212°F.
- Electronic maximum limiter setting range: 20 to 127°C / 68 to 261°F
  The maximum boiler water temperature limit can be adjusted via coding address 06.

Lower control range limits
In standard mode and when frost protection is active, the control unit regulates the boiler water temperature in accordance with the respective boiler.

Control sequence

Boiler goes cold
(set value –2 K)
The burner is activated if the boiler temperature is 2°C / 3.6°F below the calculated set point temperature.
The burner may be delayed a few minutes depending on the connected auxilliary equipment and the fuel type.

Boiler heats up
The burner shutdown point is determined by the switch-off differential (coding address 13).

Cascade control unit

Brief description

The supply temperature is regulated by starting or stopping the burner or by starting/stopping individual burner stages.
Depending on the type of control:
- The boilers will be controlled to the set boiler water temperature determined by the cascade control (stand-alone type of control)
  or
- The cascade controls the boilers by pre-setting an individual boiler output (sequential control strategy).

Subject to the system design, you may select between one gross calorific strategy and two net calorific strategies.
The boiler sequence (see page 129) can be determined via coding 2 and the boiler sequence selection.

Coding addresses which influence the cascade control
35 to 3F, 41 to 4A.
For a description, see the coding overview.

Set supply temperature

The set supply temperature is determined from
- The supply temperature setpoint values of system circuit A1 and mixing valve circuits M2 and M3,
- The set supply temperature values of additional heating circuit loads (e.g. Vitotronic 050),
- The set DHW temperature and external demands (e.g. the set supply temperature required by coding address 9b or via the Input Module 0 to 10 V).

Upper control limit
Electronic maximum system supply temperature limit.
Setting range: 20 to 127°C / 68 to 261°F.
The maximum supply temperature limit can be adjusted via coding address 37.
This value must be set no higher than the lowest value of coding address 06 of all connected Vitotronic 100, GC1.

Lower control range limit
Electronic minimum system supply temperature limit.
Setting range: 20 to 127°C / 68 to 261°F.
The minimum supply temperature limit can be adjusted via coding address 36.

Cascade control *(continued)*

Control sequence

Stand-alone (Autonomous) type of control sequence

Parallel boiler arrangement
(coding 3b: 0 without supply temperature sensor or
coding 3b: 1 with supply temperature sensor)
With the stand-alone type of control in a parallel hydraulic boiler arrangement, the cascade control unit defaults the set boiler water temperature for all active boilers.
Every Vitotronic 100, GC1 individually regulates the defaulted set temperature.

Boilers arranged in series
(coding 3b: 2 without supply temperature sensor or
coding 3b: 3 with supply temperature sensor)
With the stand-alone type of control in a hydraulic boiler arrangement series, the cascade control unit pre-sets the set boiler water temperature for all active boilers.
Difference to parallel arrangement:
When the lead boiler (condensing boiler) does not achieve the required boiler water temperature, it will only act to control the return temperature of all downstream boilers.
In a boiler arrangement series, only the net calorific strategy 2 (see page 127) is useful. The conventional boiler is started late and is also shut down late.

The control sequence is subject to the start-up and shutdown criteria set by the control strategy (coding address 3C):
- Gross calorific strategy.
- Net calorific strategy 1.
- Net calorific strategy 2.

With supply temperature sensor:
The control deviation is calculated from the set supply temperature and the actual supply temperature to determine the start-up and shutdown criteria.

Without supply temperature sensor:
The control deviation is calculated from the set boiler water temperature and estimated average actual boiler water temperature of the active boiler to determine start-up and shutdown criteria. Only those boilers are taken into consideration whose isolation valve is not closed.

Cascade control *(continued)*

Sequential type of control sequence
(coding 3b: 4)

With the sequential type of control, the cascade control unit regulates to the required set supply temperature by pre-setting the output for each individual boiler. The lead boiler can be operated in modulating mode. All other boilers are operated in two stages via a defaulted output (incl. modulating burners).

The control sequence is subject to the start-up and shutdown criteria set by the control strategy (coding address 3C):
- Gross calorific strateg.
- Net calorific strategy 1.
- Net calorific strategy 2.

With supply temperature sensor:
The control deviation is calculated from the set supply temperature and the actual supply temperature to determine the start-up and shutdown criteria.

Without supply temperature sensor:
The control deviation is calculated from the set boiler water temperature and the estimated average actual boiler water temperature of the active boiler to determine the start-up and shutdown criteria. Only those boilers are taken into consideration whose isolation valve is not closed.

Condensing strategy

It is the aim of the gross calorific strategy to operate as many boilers as possible at the lowest output level.

Advantages:
- Optimum utilization of the condensing effect (as many boilers active as possible).
- Long burner operating times.

Start-up criteria
The boiler is started via an output statement (coding 3d: 1).
An additional boiler will be started, when the currently required output can also be achieved by the currently active boiler plus the next boiler in the boiler sequence (see page 129).

Shutdown criteria
The boiler is shut down via a shutdown integral. The shutdown criteria is met when the shutdown integral exceeds a limit set via coding address 46, and the boiler started last will be shut down.

Cascade control *(continued)*

Net calorific strategy 1

Conventional boilers are preferably operated at their upper output range, to reliably prevent the formation of condensate due to low return temperatures.
With net calorific strategy 1, an additional boiler will only be started if the maximum output of all currently active burners is insufficient to achieve the set supply temperature.
A boiler will be shut down, when the remaining boiler(s) can achieve the required output on its/their own.

Benefit:
As few boilers as possible are active.

Start-up criteria
The boiler is started via a start-up integral.
The start-up criteria is met when the start-up integral exceeds a limit set via coding address 45, and the next boiler in the sequence will be started (see page 129).

Shutdown criteria
The boiler is shut down via an output statement (coding 3d: 1).
A boiler is shut down when the currently required output can be achieved without the boiler which was started last.

Net calorific strategy 2

With the net calorific strategy 2, an additional boiler will only be started if the maximum output of all currently active burners is insufficient to achieve the set supply temperature.
A boiler will be shut down if the burner was returned to its minimum output because of a large negative control deviation, and the output is then still too high.

Benefit:
Long burner operating times

Start-up criteria
The boiler is started via a start-up integral.
The start-up criteria is met when the start-up integral exceeds a limit set via coding address 45, and the next boiler in the sequence will be started (see page 129).

Shutdown criteria
The boiler is shut down via a shutdown integral. The shutdown criteria is met when the shutdown integral exceeds a limit set via coding 3d: 1, and the boiler started last will be shut down.

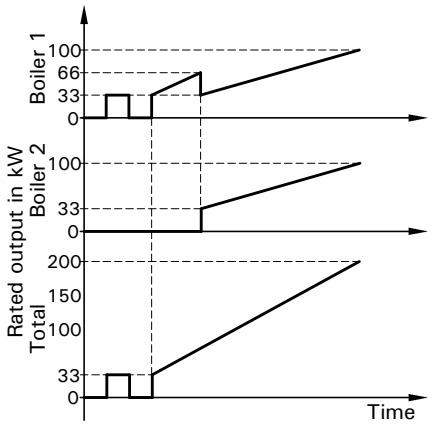
Cascade control *(continued)*

Control strategy example

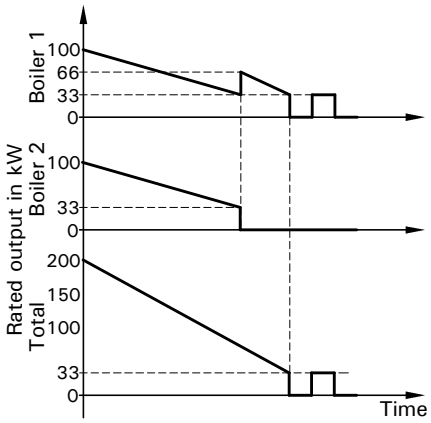
Two boiler system with modulating burner:
- Boiler 1: 100 kW rated output (basic load adjusted to 33 %, see page 96)
- Boiler 2: 100 kW rated output (basic load adjusted to 33 %, see page 96)

Gross calorific strategy (coding 3C: 0)

Start-up

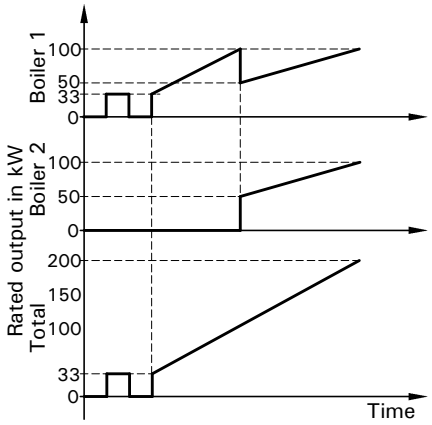


Switching OFF

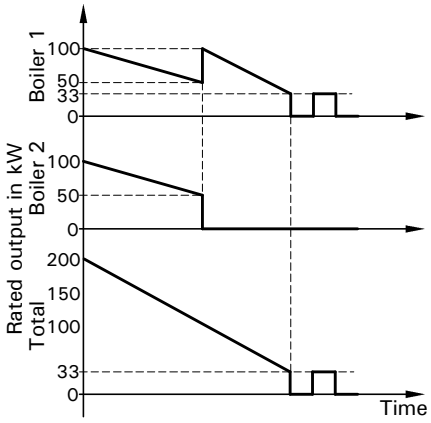


Net calorific strategy 1 (coding 3C: 1)

Start-up



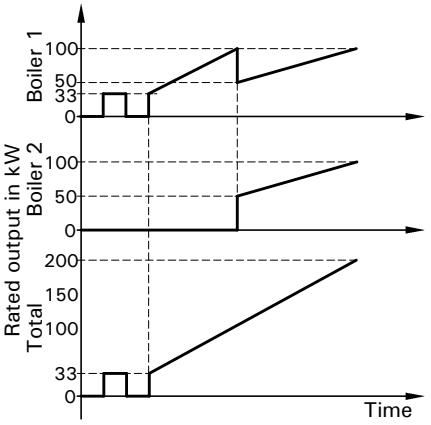
Switching OFF



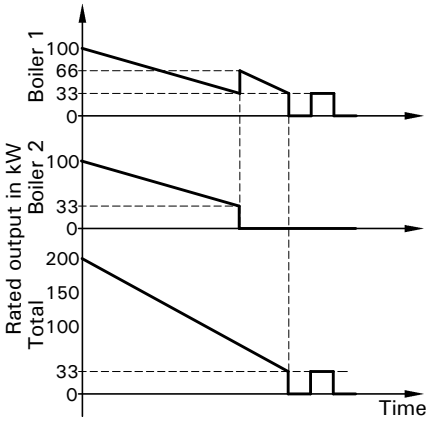
Cascade control *(continued)*

Net calorific strategy 2 (coding 3C: 2)

Start-up



Switching OFF



Boiler sequence

The boiler sequence is determined by the boiler sequence selection and the following coding addresses (see also page 168):

38 Changing the lead boiler and the boiler sequence.
- 38: 1 Every 1st day of the month, the boiler with the burner which has operated for the shortest number of hours becomes lead boiler.
- 38: 2 After 200 to 20,000 run hours, the boiler with the next higher number (coding address 07 of Vitotronic 100) becomes lead boiler.

39 Boiler 1, 2, 3 or 4 permanent lead boiler.

3A Boiler 1, 2, 3 or 4 permanent last boiler.

41 ECO threshold boiler 1.

42 ECO threshold boiler 2.

43 ECO threshold boiler 3.

44 ECO threshold boiler 4.

Via the ECO threshold, every boiler can be disabled or enabled subject to the outdoor temperature. The ECO control becomes disabled, if the boiler is required to achieve the set supply temperature, when enabled boilers have failed. At least the lead boiler remains active if all boilers in a system are disabled by the ECO control.

Heating circuit control

Brief description

The control unit provides control circuits for one high temperature (boiler) circuit and two mixing valve circuits.
The set supply temperature of every heating circuit results from the outdoor temperature, the set room temperature, the operating mode and the heating curve.
The supply temperature of the system circuit corresponds to the common system supply temperature.
The supply temperature of the mixing valve circuits is regulated by the stepped opening or closing of the mixing valves.
The mixing motor control changes the actuating and pause times subject to the control difference (control deviation).

Coding addresses which influence the heating circuit control

A0 to F2
For a description, see the coding overview.

Functions

The high temperature (boiler) circuit is subject to the boiler water temperature and its control range limits.
The heating circuit pump is the controlling element. The mixing valve circuit supply temperature is recorded by the supply temperature sensor.

Time program

The control unit timer changes in accordance with the times programmed in the room heating and DHW heating program between the heating with normal room temperature and heating with reduced room temperature operating modes.
Every operating mode has its own set level.

Outdoor temperature

A heating curve must be set up for matching the control unit to the building and the heating system.
The heating curve characteristics determine the set boiler water temperature subject to outdoor temperature. An average outdoor temperature (dampened) is used for control purposes. This comprises the actual and the adjusted outdoor temperature.

Heating circuit control *(continued)*

Domestic hot water temperature
- With priority control:
  The set supply temperature will be set to 0°C / 32°F during DHW heating.
  The mixing valve closes, and the heating circuit pumps are switched OFF.
- Without priority control:
  The heating circuit control unit continues to operate with the same set value.

Room temperature
In conjunction with remote control and room temperature input (observe coding address b0).

Compared to the outdoor temperature, the room temperature has a greater influence on the common set supply temperature. This influence may be adjusted via coding address b2.
In conjunction with the mixing valve circuit:
For control differences (actual value deviation) above 2°C / 3.6°F room temperature, the influence can be increased again (via coding address b6, quick heat-up/quick setback).

Quick heat-up:
The set room temperature must be raised by a minimum of 2°C / 3.6°F by:
- Pressing party button.
- Changing from heating with reduced temperature to heating with normal temperature.
- Start-up optimisation.

Quick heat-up will stop when the set room temperature has been reached.

Quick setback:
The set room temperature must be reduced by a minimum of 2°C / 3.6°F by:
- Pressing economy button.
- Changing from room heating with normal temperature to heating with reduced temperature.
- Shutdown optimisation.

Quick setback will stop when the set room temperature has been reached.

Heating circuit pump logic (economy circuit)
The heating circuit pump is switched OFF (set supply temperature set to 0°C / 32°F), when the outdoor temperature exceeds the value selected via coding address A5.

Extended economy circuit
The heating circuit pump is switched OFF, and the set supply temperature is set to 0°C / 32°F, if:
- The outdoor temperature exceeds the value selected via coding address A6.
- The set room temperature is reduced via coding address A9.
- In conjunction with the mixing valve circuit:
  The mixing valve has been closed for 12 minutes (mixing valve economy function, coding address A7).
- When the actual room temperature exceeds the value set at coding address b5.

Slab curing function
(only in conjunction with a mixing valve circuit).

Please note:
Four different temperature profiles can be selected for drying the slab. These profiles are activated via coding address F1.

When the slab curing function is activated, the heating circuit pump of the mixing valve circuit is switched ON, and the supply temperature will be held at the selected profile. After completion (30 days), the mixing valve circuit will be regulated automatically via the set parameters.

System dynamics – mixing valve circuit
(only in conjunction with a mixing valve circuit)

You can influence the control characteristics of the mixing valve via coding address C4.

Central operation
Central operation for all downstream heating circuits can be programmed via coding address 7A.
The heating and holiday program then applies to all heating circuits in the system.
The programming unit of the other heating circuits displays **central control** when the heating program and holiday program buttons are activated.
Any set holiday programs in the heating circuit programming units will be deleted.

Party and economy buttons on **all** control units are without effect.

Frost protection
When the outdoor temperature falls below +1°C / 34°F, a supply temperature of at least 10°C / 50°F will be safeguarded.
For changes, see coding address A3, variable frost limit.

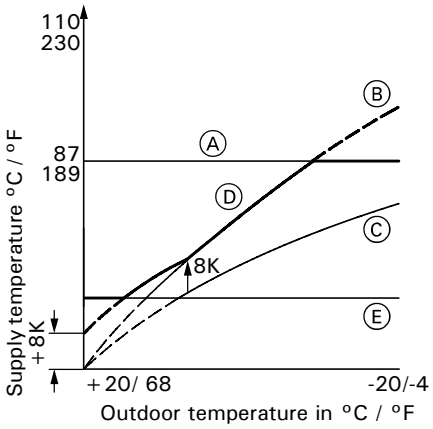
Heating circuit control *(continued)*

Supply temperature control
Differential temperature:
The differential temperature may be adjusted via coding address 9F; factory supplied setting 8°C / 15°F .

The differential temperature is that minimum temperature differential by which the common supply temperature should be higher than the currently required supply temperature of the mixing valve circuit.

- System with only one mixing valve circuit:
  The common set supply temperature will be automatically held 8°C / 15°F above the set supply temperature of the mixing valve circuits.

- System with high temperature (boiler) circuits and mixing valve circuits:
  The common set supply temperature operates in accordance with its own heating curve. The differential temperature of 8°C / 15°F towards the set supply temperature of the mixing valve circuits is set up at the factory.



Ⓐ Max. common supply temperature
Ⓑ Slope = 1.8 high temperature (boiler) circuit
Ⓒ Slope = 1.2 mixing valve circuit
Ⓓ Common supply temperature (at a differential temperature = 8°C/ 15°F)
Ⓔ Minimum common supply temperature

Upper control limit
Electronic maximum limit:
Setting range: 1 to 127°C / 34 to 261°F.
Changes via coding address C6.

Please note:
The maximum limit is no replacement for the underfloor heating system temperature limiter.

Lower control range limit
Electronic minimum limit:
Setting range: 1 to 127°C / 34 to 261°F.
Changes via coding address C5 (only effective in standard mode).

Control sequence

Mixing valve circuit
The mixing valve motor will not be activated within the neutral zone (±1°C / 2°F).

Supply temperature falls
(set value –1°C / -2°F)
The mixing valve motor receives the open signal.
The signal duration lengthens with an increasing control differential. The duration of pauses reduces with an increasing control differential.

Supply temperature rises
(set value +1°C / 2°F)
The mixing valve motor receives the close signal.
The signal duration lengthens with an increasing control differential. The duration of pauses reduces with an increasing control differential.

DHW tank temperature control

Brief description

The DHW tank control logic is a set-point control. It is the result of starting and stopping the DHW pump. The switching differential is ±2.5°C / 4.5°F.

During DHW tank heating, a constant boiler supply temperature will be set (20°C / 36°F higher than the set DHW tank temperature, adjustable via coding address 60) and space heating is switched OFF (optional DHW tank priority).

Coding addresses which influence the DHW tank control
54 to 75, 7F, A2.
For a description, see the coding overview.

Functions

Time program
An automatic program or an individual time program may be selected for DHW heating and the control of the DHW recirculation pump.
Compared with the space heating circuit's heat-up phase, DHW heating in automatic mode starts 30 minutes earlier.
The individual time program enables up to four switching periods per day to be set via the time switch to control the DHW heating/heating and the DHW recirculation pump.
Any DHW tank heating sequence will be completed, independent of the time program.

In conjunction with coding address 7F
7F: 1 Detached house:
- Automatic mode:
  For systems with two or three space heating circuits, the heating times for the first of the existing heating circuits will be applied.
- Individual time program:
  The switching times for DHW heating and the DHW recirculation pump have the same effect on all heating circuits.

7F : 0 Apartment building:
- Automatic mode:
  For systems with two or three heating circuits, the heating times for the respective heating circuit will be applied.
- Individual time program:
  The switching times for DHW heating can be adjusted separately for each heating circuit.

DHW priority
- With DHW priority (coding A2: 2):
  The set supply temperature will be set to 0°C / 32°F while the DHW tank is being heated.
  The mixing valve closes, and the heating circuit pumps are switched OFF.
- With DHW priority:
  The heating circuit control unit continues to operate with the same set value.

Frost protection
The DHW tank will be heated to 20°C / 68°F, if the DHW temperature falls below 5°C / 41°F.

Auxiliary functions – DHW heating
This function is activated by providing a second set DHW temperature via coding address 58 and activating the 4th DHW phase for DHW heating.

Set DHW temperature
The set DHW temperature can be adjusted between 10 and 60°C / 50 and 140°F. The set range can be expanded to 95°C / 203°F via coding address 56.
You can select the set DHW temperature at the programming unit of the control and at every Vitotrol 300 remote control unit (if installed).
You can determine the allocation to individual heating circuits via coding address 66.

DHW recirculation pump
It delivers hot water to the draw-off points at adjustable times. Up to four control periods can be set at the timer.

Auxiliary circuits
The DHW heating can be disabled or enabled by changing over the heating program.

System with DHW tank heating system
The above functions also apply in conjunction with calorifiers.
Set the following codings:
4C: 1, 4E: 1, 55: 3.
For a description, see the coding overview.

Systems with Vitosolic
A third DHW temperature set-point can be programmed via coding address 67. Reloading suppression will be active below the set temperature. The DHW tank is heated only by the solar heating system.

DHW tank temperature control *(continued)*

Control sequence

Pump delay
- The DHW pump continuous operation (coding 62: 10) after the DHW tank heating, until:
  - the actual temperature is 5°C / 9°F higher than the set DHW temperature or
  - the maximum time delay (adjustable via coding address 62) has been reached.
- Without the pump time-delay for DHW tank heating (coding 62: 0).

Coding 55: 0:
DHW heating

The DHW tank goes cold
(set value –2.5 °C / 4.5 °F, adjustable via coding address 59)
The common supply temperature is adjusted 20°C / 36 °F higher than the set DHW (adjustable via coding address 60).

The DHW tank is hot
(set value +2.5°C / 4.5°F)
The common set supply temperature is returned to the weather-compensated value.
- The boiler temperature dependant switching of the DHW pump for DHW tank heating (coding 61 10): The DHW pump switched on when the boiler water temperature is 7°C / 13°F higher than the DHW temperature.
- Immediate enabling of the DHW pump for DHW tank heating (coding address 61:1).

Coding 55: 1:
Adaptive DHW tank heating

With adaptive DHW tank heating, the speed of the temperature rise during DHW heating is taken into account. Also taken into account is the question of whether the boiler will be required to supply heat after the DHW tank has been heated or whether residual boiler heat should be transferred to the DHW tank.
Accordingly, the control unit determines the burner and DHW recirculation pump shutdown point to prevent the set DHW temperature being substantially exceeded after the DHW tank has been heated.

Coding 55: 2:
DHW tank temperature control with 2 DHW tank temperature sensors

The 1st DHW tank temperature sensor enables the DHW pump, and is evaluated for stop conditions during the pump run-on time. The 2nd DHW tank temperature sensor (inside the cold water inlet) is designed to prematurely start DHW tank heating when large quantities of DHW are drawn off as well as to prematurely stop DHW tank heating if no DHW is drawn.
On and off switch-points are coded via addresses 68 and 69.

Coding 55: 3:
DHW tank control – DHW heating (for DHW heating systems only)
The DHW tank goes cold
(set value –2.5°C / -4.5°F, adjustable via coding address 59),
- The common set supply temperature is adjusted 20°C / 36°F higher than the set DHW temperature (adjustable via coding address 60).
- The primary DHW pump is switched ON.
- The three-way mixing valve opens and then regulates to the defaulted set value.
- The DHW pump cycles (short term ON and OFF) until the set supply temperature has been reached, then it runs constantly. If, during DHW tank heating, the actual value stays below the required set supply temperature, then the DHW pump will temporarily cycle again.

The DHW tank is hot
(1st DHW tank temperature sensor:
Actual value ≥ set value
and
2nd DHW tank temperature sensor:
Actual value > set value –1.5°C / -2.7°F)
- The common set supply temperature is returned to the weather-compensated value;
- The DHW pump:
  - is immediately switched OFF, if the three-way mixing valve is open or
  - is switched OFF after run-on time adjustable via coding 62.

Components from the parts list

Line voltage motherboard

The main Printed Circuit Board comprises:
- Relays and outputs for controlling pumps, actuators and the burner.
- Slot for power supply unit and boiler control unit.

Low voltage motherboard

The main Printed Circuit Board comprises:
- Connection plug for sensors, communication connections and external connections.
- Slot for Printed Circuit Board, LON communication module, programming unit, boiler coding card and Optolink Printed Circuit Board.

Power supply unit Printed Circuit Board

The power supply unit Printed Circuit Board comprises the low voltage supply for all electronic equipment.

Safety unit

The safety unit comprises:
- Fuses
- Power ON/OFF switch
- Test button

Supplementary Printed Circuit Board

When replacing the Printed Circuit Board:
1. Record the coding and adjustments made at the control unit.
2. Replace the Printed Circuit Board.
3. Set coding 8A: 176, and coding address 92 to 92: 160.

Printed Circuit Board Optolink/override switch

The Printed Circuit Board comprises:
- Burner standby display
- Fault display
- Optolink laptop interface
- Override switch

Override switch for flue gas measurement with briefly raised boiler water temperature.

The following functions are triggered in position ✋:
- Burner start (may be delayed through fuel oil pre-heating, or other accessory equipment).
- Starting all pumps.
- Control of the boiler water temperature by the ⏱ adjustable high limit.

Programming unit

Setting the:
- Heating program
- Set values
- Coding

Displaying:
- Temperatures
- Operating conditions
- Faults

Fuses

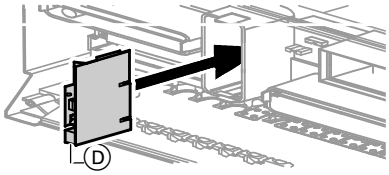
F1: 6.3 A (slow), 250 V,
to protect the actuators, pumps, and all electronics.

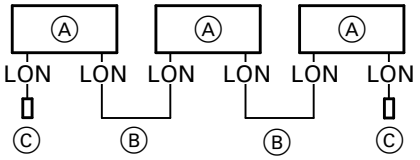
F2: 6.3 A (slow), 250 V,
to protect the burner.

Components from the parts list

LON communication module

Plug in the LON communication module into the control unit.
The communication interruption will be displayed.





Ⓐ Control unit or Vitocom 300
Ⓑ Interconnecting cable for data exchange between the control units, Part No. 7143 495
Ⓒ Terminators, (standard delivery – Vitocontrol-S, VD2/CT3/CM2)
Ⓓ Slots for Ⓑ and Ⓒ

Fixed high limit

- In the factory setting set to 110°C / 230°F , adjustable to 99°C / 212°F
- Electromechanical temperature switch according to the liquid expansion principle; with lockout.
- Intrinsically safe; also lockout in case of capillary tube leaks or ambient temperatures below –10°C / 14°F.
- Limits the boiler water temperature to the maximum permissible value by shutdown and manual reset.
- Central mounting M 10, capillary 3600 mm / 142 inches long
  Probe ∅ 3 mm / 0.1 inches, 180 mm / 7 inches long.
- Tests:
  Effectiveness via test **(TÜV)** button.

Test button

For testing the fixed high limit.
For a description, see page 91.

Adjustable high limit

- In the factory setting set to 95°C / 203°F, adjustable to 100°C / 212°F.

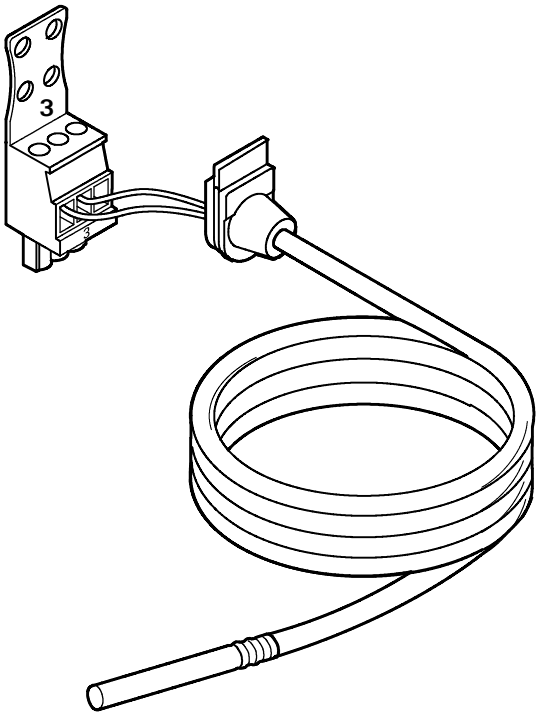
IMPORTANT

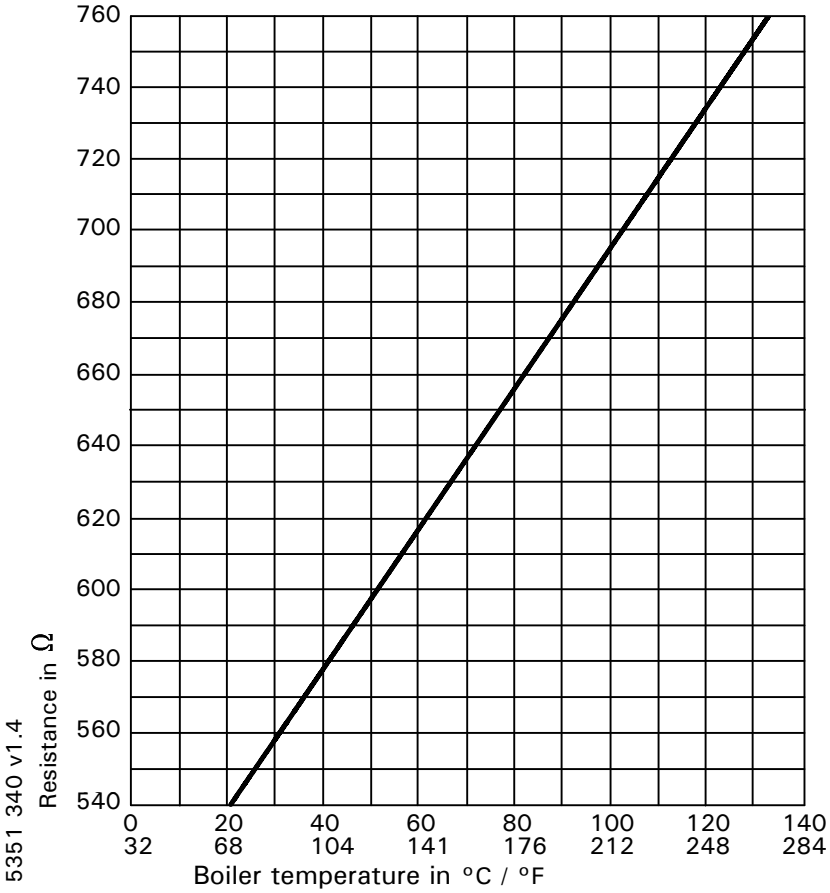
Adjust downwards at least 20°C / 36°F higher than the DHW temperature, upwards at least 15°C / 27°F lower than the fixed high limit.

- Electromechanical temperature switch according to the liquid expansion principle.
- Regulates the maximum boiler water temperature (e.g. in emission test mode).
- Adjusting shaft 6 mm / 0.2 inches half-round.
  Adjustment knob pushed on shaft from front.
- Capillary 3600 mm / 142 inches long
  Probe ∅ 3 mm / 0.1 inches, 180 mm / 7 inches long.
- Tests:
  Effectiveness via emissions test mode.

Components from the parts list *(continued)*

Boiler water temperature sensor





The sensor measures the boiler water temperature of the boiler.

The boiler temperature sensor is installed at the same time as the boiler insulation.

Check the sensor

1. Disconnect plug 3 in the terminal compartment of the boiler control.
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Boiler water temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

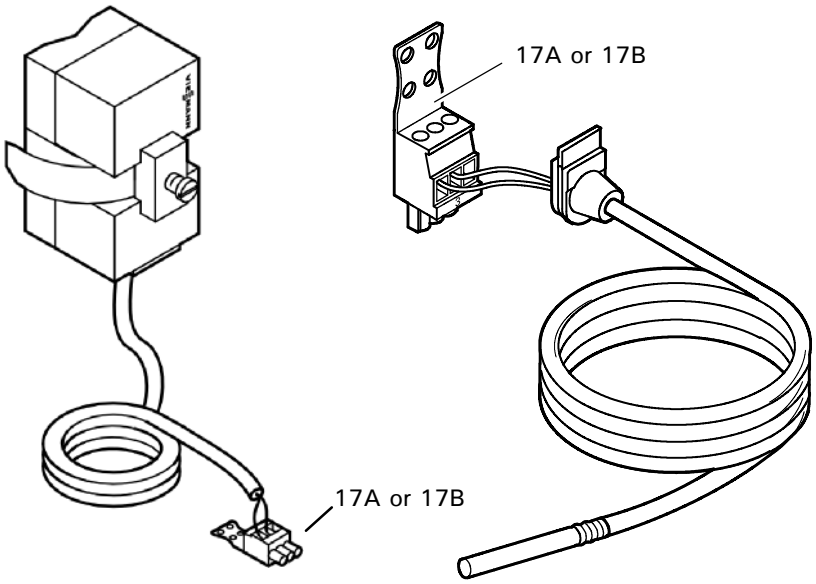
Degree of protection: IP 32
Ambient temperature:
- During operation:
  0 to + 130°C
  32 to + 266°F
- During storage and transport:
  -20 to + 70°C
  - 4 to + 158°F

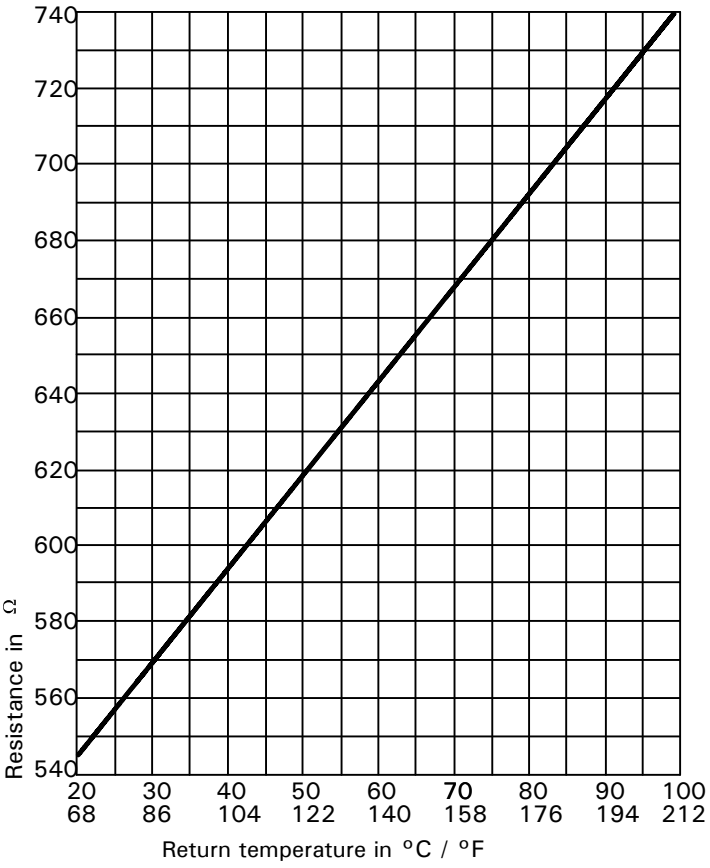
Electrical connection

The sensors are ready to plug in. Insert the boiler temperature sensor in socket "3" of the boiler control.

Components from the parts list *(continued)*

Strap-on temperature sensor and immersion temperature sensor





For measuring the boiler return temperature.

Electrical connection
The sensor is inserted in socket "17A" or "17B" on the boiler control.

Check the sensor

1. Disconnect plug 17 A or 17 B in the terminal compartment of the boiler control.

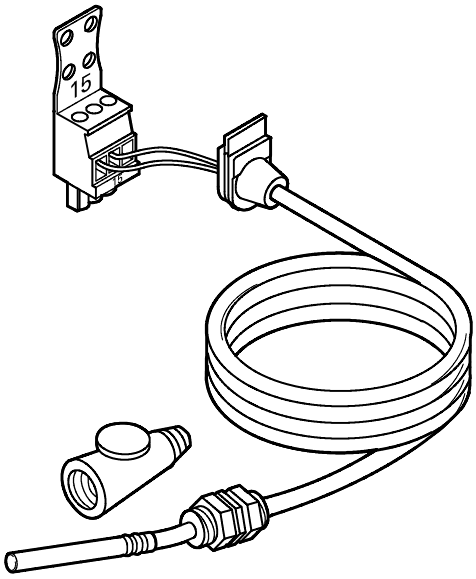
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

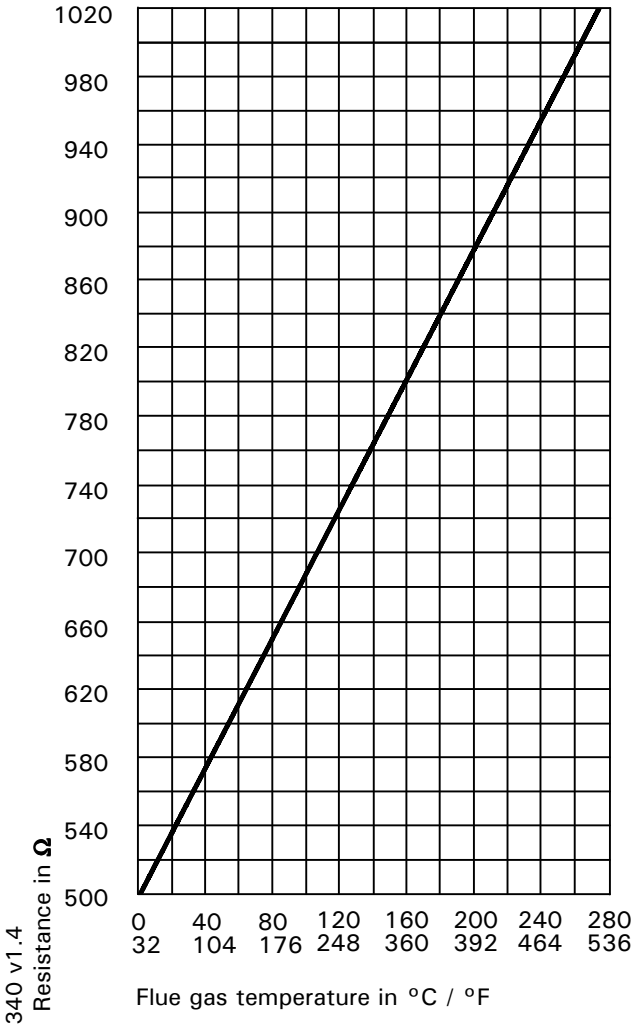
Return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature:
- During operation: 0 to + 100°C
  32 to + 212°F
- During storage and transport: -20 to + 70°C
  -4 to + 158°F

Flue gas temperature sensor (for VD2/VD2A/CT3 only)





The sensor measures the flue gas temperature and monitors the selected limit value.

Electrical connection
The sensor is inserted in socket "15" on the boiler control.

Check flue gas temperature sensor

1. Disconnect plug [15] in the terminal compartment of the boiler control.
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Flue gas temperature in °C / °F	Resistance in Ω
80 / 176	650
160 / 320	800
200 / 392	880

3. Compare the value measured with the actual temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 60
Ambient temperature:
- During operation:
  0 to + 600°C
  32 to + 1112°F
- During storage and transport:
  –20 to + 70°C
  –4 to + 158°F

Components from the parts list

Line voltage motherboard

The main printed circuit board comprises:
- Relays and outputs for controlling pumps and actuators.
- Slot for power supply unit.

Low voltage motherboard

The main printed circuit board comprises:
- Connection plug for sensors, communication connections and external connections.
- Slot for printed circuit board, LON communication module, programming unit and Optolink printed circuit board.

Supplementary printed circuit board

When replacing the printed circuit board:
1. Record the coding and adjustments made at the control unit.
2. Replace the printed circuit board.
3. Set coding 8A: 176, and coding address 92 to 92: 184.

Mixing valve extension printed circuit board

The printed circuit board comprises the relay for controlling the mixing valve motor and the heating circuit pump of the mixing valve circuits.

Mixing valve extension supplementary Printed Circuit Board

This is plugged into the mixing valve extension printed circuit board.
All data is processed and outputs (relay) are selected.

Power supply unit printed circuit board

The power supply unit printed circuit board comprises the low voltage supply for all electronic equipment.

Programming unit

Part No. 7823 986

Setting the:
- Heating program
- Set values
- Switching times
- Heating curve (slope and shift)
- Date
- Time
- Economy and party mode
- Codings

Displaying:
- Temperatures
- Operating conditions
- Faults

Printed circuit board Optolink/override switch

The printed circuit board comprises:
- Burner standby display
- Fault display
- Optolink laptop interface
- Override switch

Override switch for analyzing flue gas with briefly raised boiler water temperature.

The following functions are triggered in position ✋:
- Starting all pumps.
- Mixing valve in control function.

Front panel with heating circuit selector buttons

Display and selection of the heating circuit.

Power ON/OFF switch

The control unit comprises:
- Fuse.
- Power ON/OFF switch.

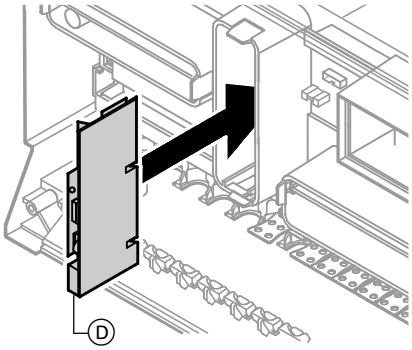
Fuse

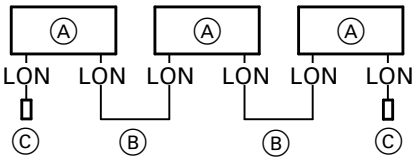
F1 6.3 A (slow), 250 V, to protect the actuators, pumps, and all electronics.

Components from the parts list *(continued)*

LON communication module

The communication interruption will be displayed.





Ⓐ Control unit or Vitocom 300
Ⓑ Interconnecting cable for data exchange between the control units, Part No. 7143 495
Ⓒ Terminators (standard delivery – Vitocontrol-S, VD2/CT3/CM2)
Ⓓ Slots for Ⓑ and Ⓒ

DHW tank temperature sensor

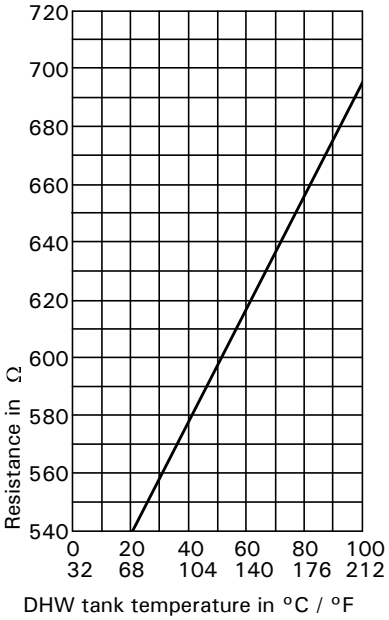
Connection
See page 77.

Check sensor
1. Remove plug [5].

2. Check the sensor resistance of the plug at terminals 1 and 2 or 2 and 3 (if a second DHW tank temperature sensor has been connected).

DHW tank temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare measurement with the actual temperature displayed (for scanning, see page 109).
Check the installation and replace sensor, if necessary, in case of severe deviation.

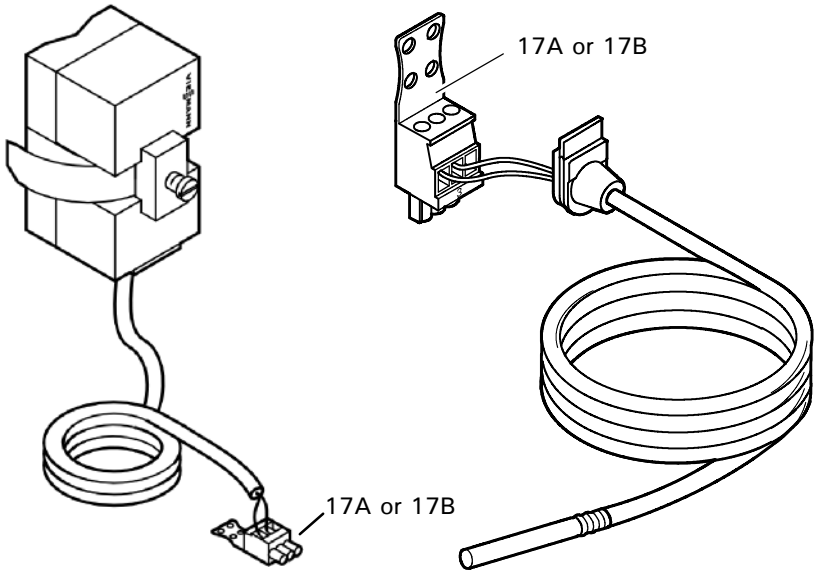


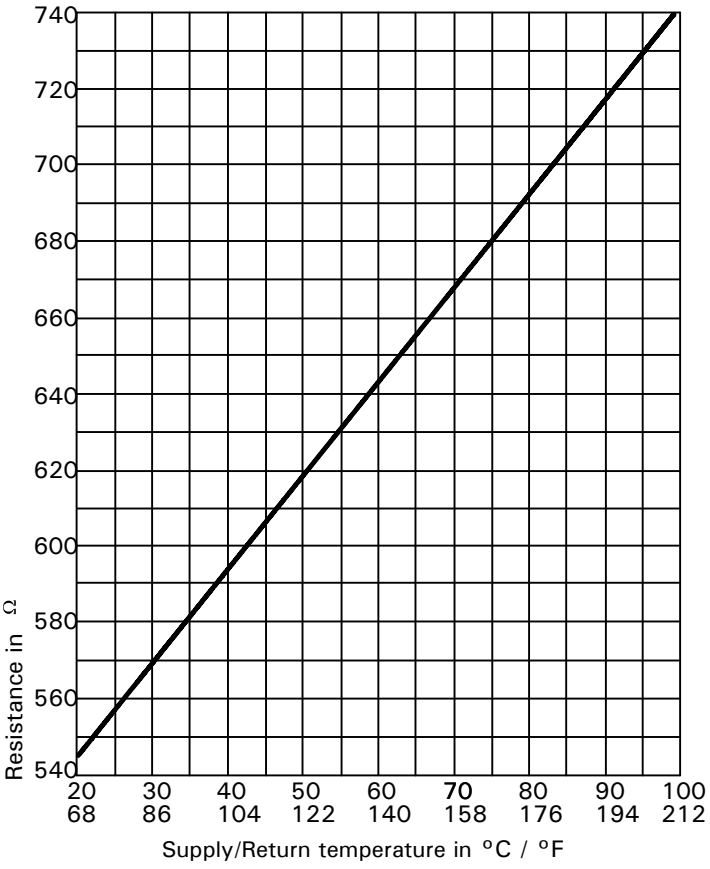
Specification
Protection: IP 32
Permiss. ambient temperature:
- During operation:
  0 to +90°C
  32 to 194°F
- During storage and transport:
  –20 to +70°C
  –4 to 158°F

Components from the parts list *(continued)*

Strap-on temperature sensor and immersion temperature sensor

To measure the supply or return temperature.





Connection
See page 77.

Check sensor

1. Remove plug [2], [17][A] or [17][B].

2. Check the sensor resistance at terminals 1 and 2 of the plug.

Supply or return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

3. Compare measurement with the actual temperature displayed (for scanning, see page 109).
Check the installation and replace sensor, if necessary, in case of severe deviation.

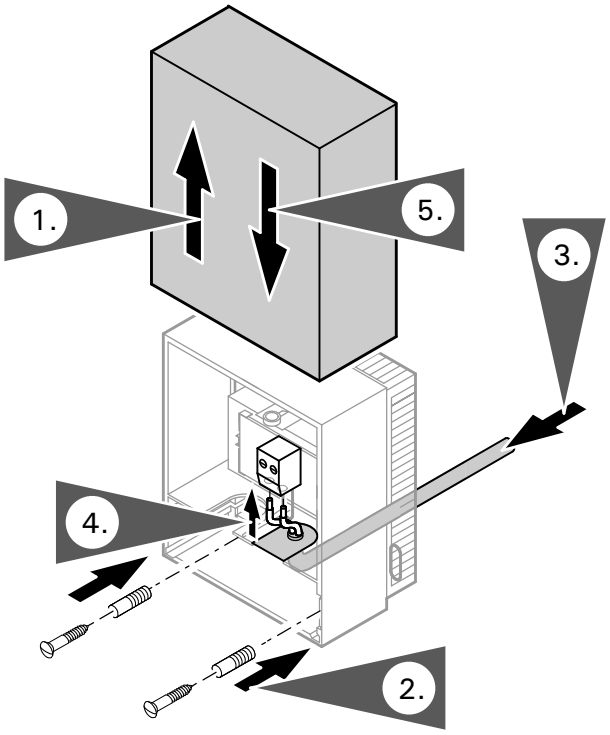
Specification

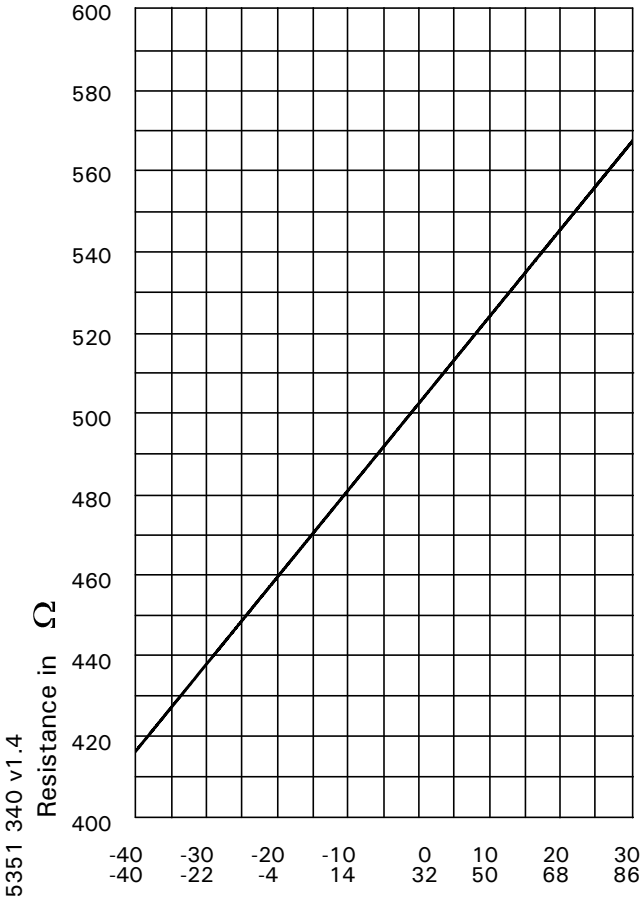
Protection: IP 32
Permiss. ambient temperature:
- During operation:
  0 to +100°C
  32 to + 212°F
- During storage and transport:
  –20 to + 70°C
  –4 to + 158°F

5351 340 v1.4

Components from the parts list *(continued)*

Outdoor temperature sensor





Connection
See page 77.

Check sensor

1. Remove plug [1].

2. Check the sensor resistance at terminals 1 and 2 of the plug.

Outdoor temperature in °C / °F	Resistance in Ω
–10 / 14	480
0 / 32	500
20 / 68	546

3. Disconnect cores from the sensor, if actual values deviate severely from the curve, repeat the sensor measurement and compare with the actual temperature (for scanning, see page 109).

4. Depending on the result, replace cable or outdoor temperature sensor.

5. Scan actual temperature (for scanning, see page 109).

Specification

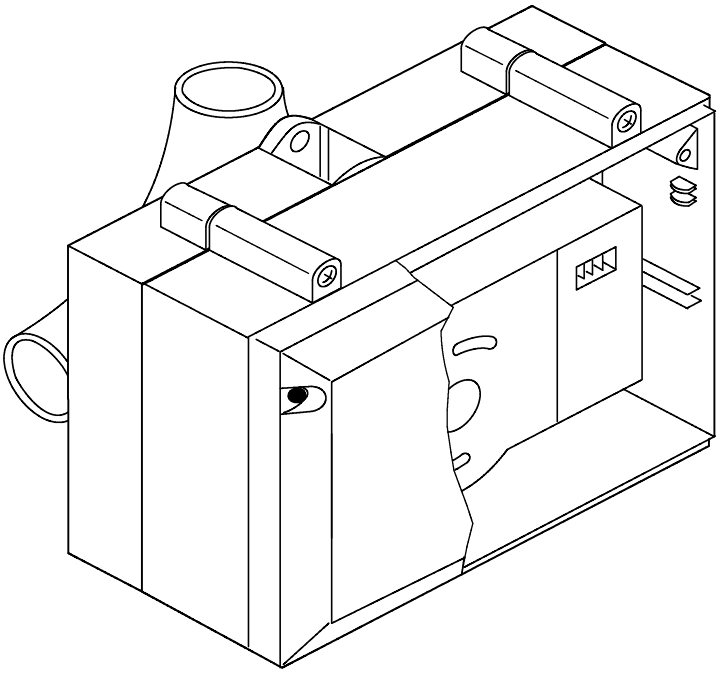
Protection: IP 43

Permissible ambient temperature during operation, storage and transport:

–40 to +70°C
–40 to 158°F

Mixing valve circuit extension kit

Mixing valve motor, Part No. 7133 390



Ⓐ Plug in the mixing valve motor
▲ Mixing valve motor open
▼ Mixing valve motor close

Changing the rotational direction
Remove the cover and reinsert 3-pole plug Ⓐ turned by 180°.

Test
The relay test of the control unit moves the mixing valve to open and close.

Manual mixing motor adjustment
Lift the motorized lever up, unhook the mixing valve handle and remove plug Ⓐ.

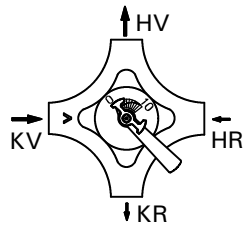
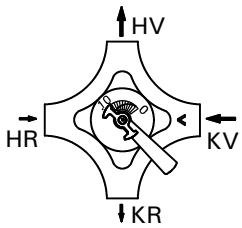
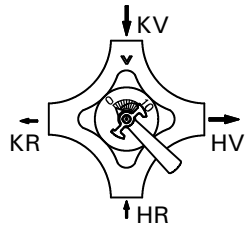
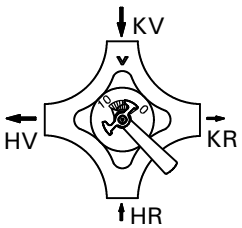
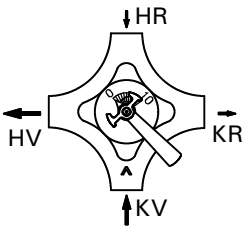
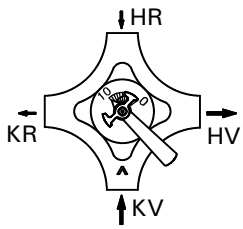
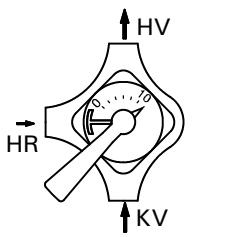
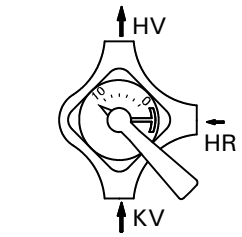
Specification

Rated voltage:	120 VAC ~
Rated frequency:	60 Hz
Power consumption:	4 W
Protection:	IP 42
Torque:	3 Nm
Run time from close to open:	120 s

For 24V actuators please refer to instructions supplied with the actuator.

Installation examples

Mixing valve insert conversion (if required), see mixing valve installation instructions.

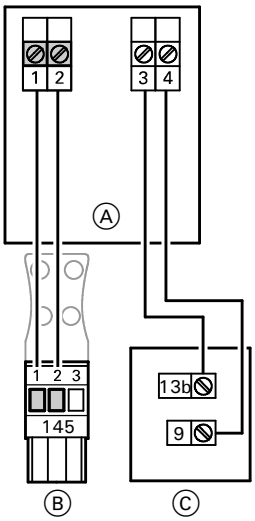
Factory supplied Mixing valve motor rotational direction	Change the mixing valve motor rotational direction for these installation examples
	
	
	
	

HR Heating return
HV Heating supply
KR Boiler return
KV Boiler supply

Remote control

Vitotrol 200, Part No. 7133 378
(with integral room temperature sensor for room temperature feed-back in conjunction with a mixing valve circuit)
Setting of:
- Day temperature
- Heating program
- Economy and party mode

Function changes can be made via coding addresses A0, b0 to b9, C0 to C2, E1, E2 and F2 (see coding overview).

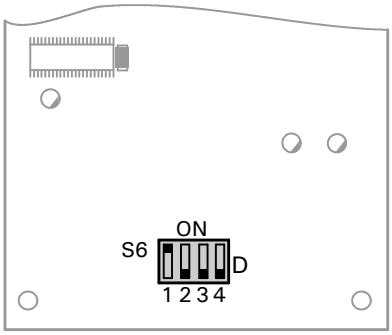


Connection
2-wire cable 164 ft / 50 m

Room temperature sensor connection
Two-wire cable, max. 35 m / 115 ft. length with a cross-section of 1.5 mm^2 (AWG 16) copper.

Ⓐ Wall mounting base for Vitotrol 200
Ⓑ To control unit
Ⓒ Separate room temperature sensor

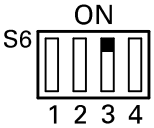
Remote control *(continued)*



Ⓓ Printed circuit board DIP switches (rear of the top casing)

Remote control affects	DIP switch setting
System circuit A1 (Heating circuit selection button [1])	Factory setting ON 1 2 3 4
Mixing valve circuit M2 (Heating circuit selection button [2])	ON 1 2 3 4
Mixing valve circuit M3 (Heating circuit selection button [3])	ON 1 2 3 4

When connecting a separate room temperature sensor, set DIP switch S6.3 to ON.



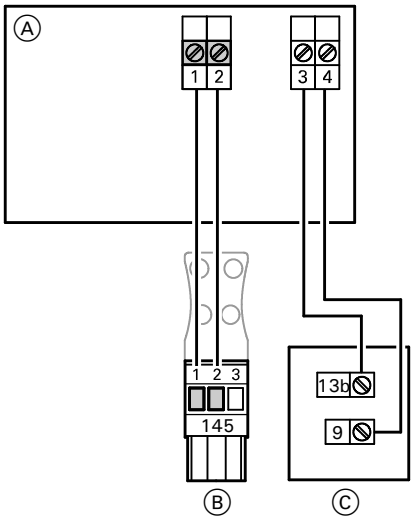
Specification
Power supply via KM BUS.
Safety class: III
Protection: IP 30
Permiss. ambient temperature
- During operation:
  0 to +40°C
  32 to 104°F
- In storage and transport:
  –20 to +65°C
  –4 to +149°F

Set room temperature setting range:
10 to 30°C
50 to 96°F
adjustable between
3 to 23°C
37 to 73°F
or
17 to 37°C
63 to 99°F
via coding address E1.
Setting of the reduced set room temperature at the control unit.

Remote control *(continued)*

Vitotrol 300, Part No. 7134 452
(with integral room temperature sensor for room temperature feed-back in conjunction with a mixing valve circuit)
Setting of:
- Normal and reduced temperature
- Domestic hot water temperature
- Heating program
- Holiday program
- Switching times
- Economy and party mode

Function changes can be made via coding addresses A0, b0 to b9, C0 to C2, E1, E2 and F2 (see coding overview).

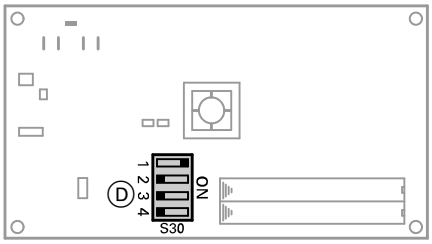


Connection
2-wire cable 164 ft / 50 m.

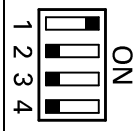
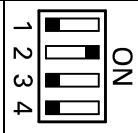
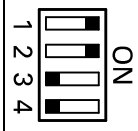
Room temperature sensor connection
Two-core cable, max. 35 m / 115 ft. length with a cross-section of 1.5 mm^2 (AWG 16) copper.

Ⓐ Wall mounting base for Vitotrol 300
Ⓑ To the control unit
Ⓒ Separate room temperature sensor

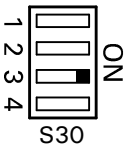
Remote control *(continued)*



Ⓓ Printed circuit board DIP switches (rear of the top casing)

Remote control affects	DIP switch setting
System circuit A1 (Heating circuit selection button [1])	Factory setting 
Mixing valve circuit M2 (Heating circuit selection button [2])	
Mixing valve circuit M3 (Heating circuit selection button [3])	

When connecting a separate room temperature sensor, set DIP switch S30.3 to ON.



Specification

Power supply via KM BUS.
Safety class: III
Protection: IP 30
Permiss. ambient temperature:
- In use:
  0 to +40°C
  32 to 104°F
- In storage and transport:
  –20 to +65°C
  –4 to +149°F

Setting range for
- Normal set room temp:
  10 to 30°C
  50 to +86°F

adjustable between
  3 to 23°C
  37 to 73°F
  or
  17 to 37°C
  63 to 97°F

via coding address E1
- Reduced set room temp:
  3 to 37°C
  37 to 97°F

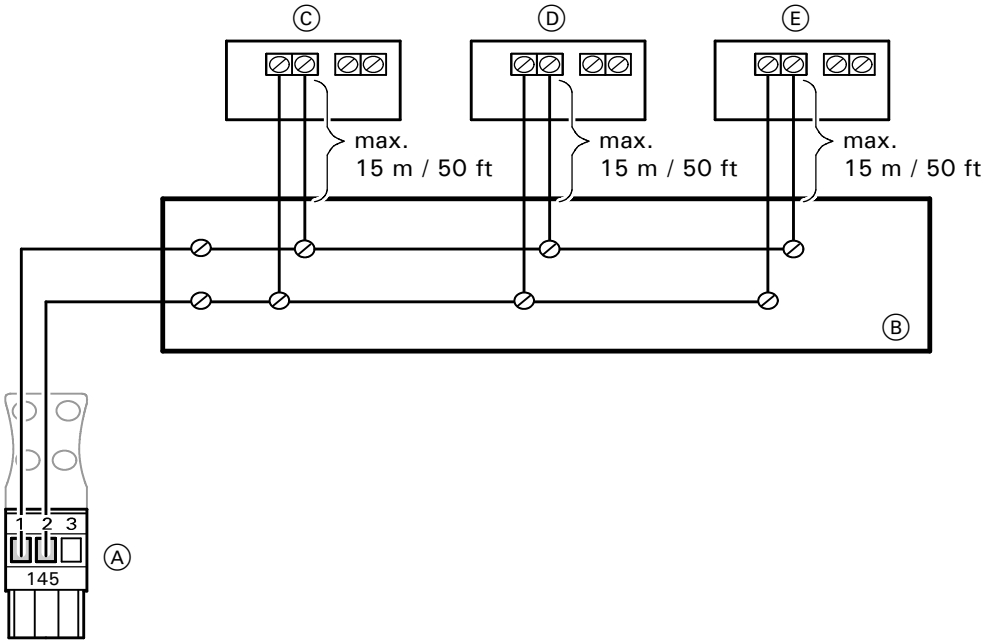
Battery type: Use alkaline manganese batteries type MICRO-LR03 (AAA) which do not contain pollutants

Remote control *(continued)*

Connecting several remote control units

When connecting several remote controls to the control unit, install a terminal box on site.

Version 1

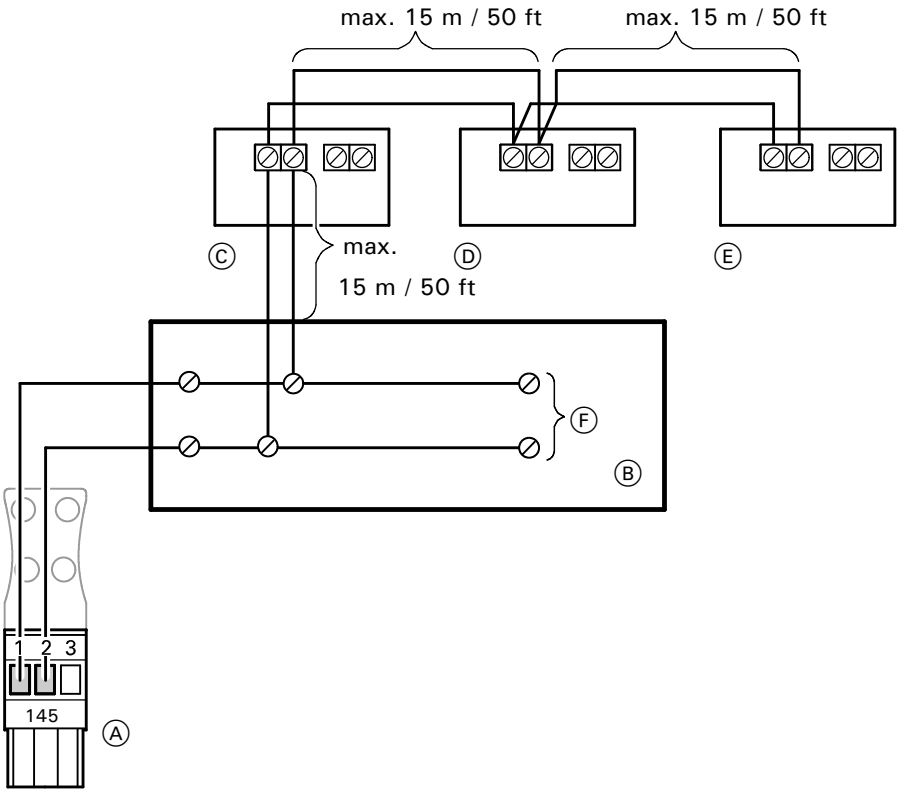


Ⓐ To control unit
Ⓑ Terminal box (on site)
Ⓒ Vitotrol 1
Ⓓ Vitotrol 2
Ⓔ Vitotrol 3

- On-site connection via terminal box: Connect in accordance with the diagram.
- The total length of all KM BUS cables should be limited to 50 m / 164 ft.

Remote control *(continued)*

Version 2

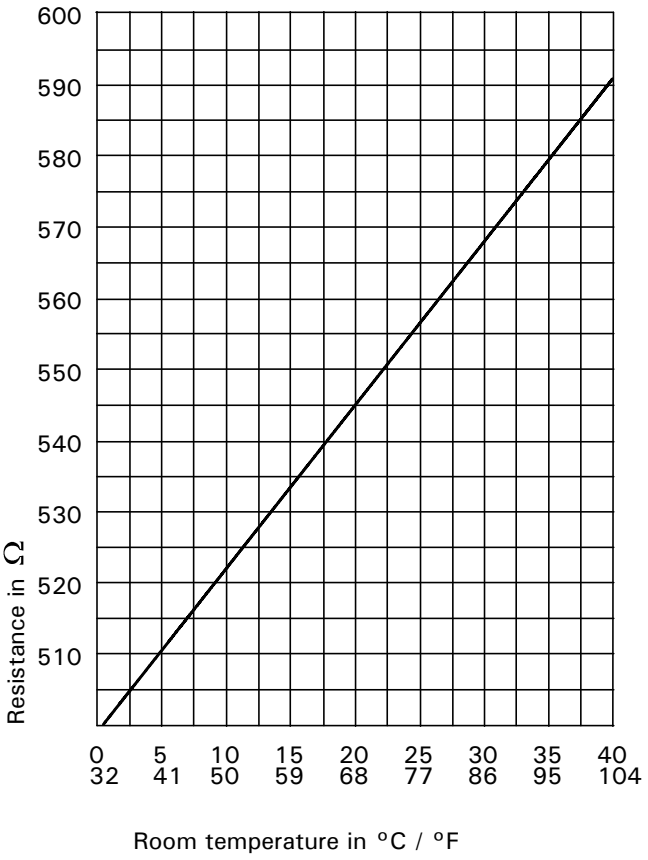


Ⓐ To control unit
Ⓑ Terminal box (on site)
Ⓒ Vitotrol 1
Ⓓ Vitotrol 2
Ⓔ Vitotrol 3
Ⓕ Further BUS participants

- If several remote control units and additional KM BUS participants are connected, make the connections via a terminal box (on-site) as shown in the diagram.
- The total length of all KM BUS cables should be limited to 50 m / 164 ft.

Room temperature sensor, Part No. 7133 379

The room temperature sensor measures the actual room temperature, if the remote Vitotrol unit cannot be installed in a suitable location.



Connection
See page 77.

Check sensor

1. Disconnect the wires from the sensor.

2. Check the sensor resistance at terminals 9 and 13b.

Room temperature in °C / °F	Resistance in Ω
10 / 50	522
15 / 59	534
25 / 77	557

3. Compare measurement with the actual temperature displayed (for scanning, see page 109).
   Check the installation and replace sensor, if necessary, in case of severe deviation.

Specification

Protection: IP 30

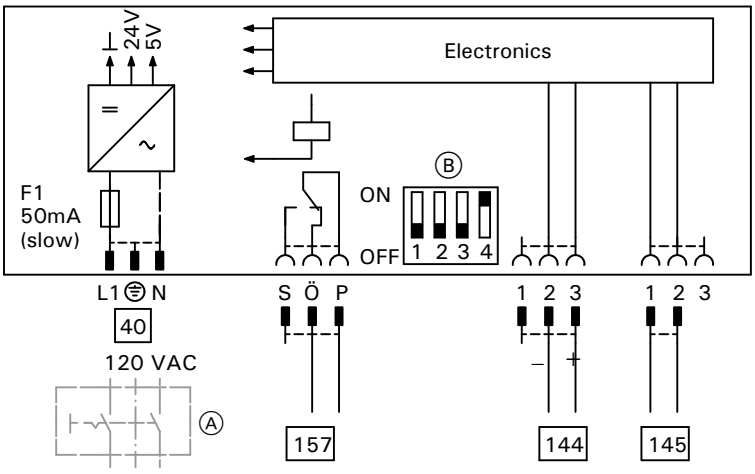
Permiss. ambient temperature:

- During operation:
  0 to +40°C
  32 to 104°F
- In storage and transport:
  –20 to +65°C
  –4 to +149°F

Input Module 0 to 10 V, Part No. 7134 561

From software version 7 of Vitocontrol-S, VD2/CT3/CM2, the Input Module can be connected (software version via scan 2: 1st digit, display ≥7).

For external control of the boiler/supply temperature via a 0 to 10VDC signal
10 to 100°C or 30 to 120°F
50 to 212°C or 86 to 248°F
or
to signal reduced mode and regulate a heating circuit pump to a lower speed.

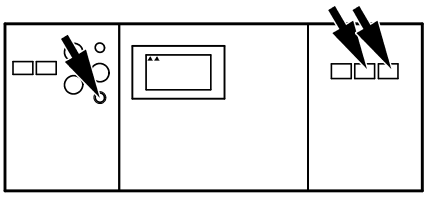


40 Power connection
144 0 to 10VDC input
145 KM BUS to control unit
157 Potential free output contact
A Power supply (provide disconnect if required by code)
B DIP switch (see table)

DIP switch		Function
1 to 3:	OFF	Switch for pre-set value
1:	ON	Reduced mode – system circuit A1
2:	ON	Reduced mode – mixing valve circuit M2
3:	ON	Reduced mode – mixing valve circuit M3
4:	ON	Pre-set value default 10 to 100°C / 50 to 212°F
4:	OFF	Pre-set value default 30 to 120°C / 86 to 248°F

Please note:
Amongst switches 1 to 3, only **one** switch may be set to ON.

Resetting codings to the factory setting



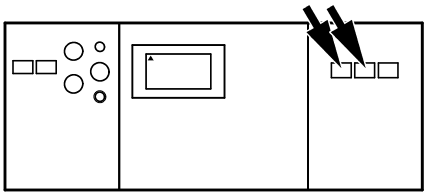
1. Press and simultaneously for approx. two seconds, until the first two arrows appear in the display.

2. Press .

5351 340 v1.4

Coding 1

Calling up coding 1



1. Press ⏻ and 🚿 simultaneously for approx. two seconds, until the first arrow appears in the display.
2. Select the required coding address with ⊕ or ⊖;
   the address flashes;
   confirm with OK,
   the value flashes.
3. Change the value with ⊕ or ⊖;
   confirm with OK.
   The value is transferred and does not flash for approx. 2 seconds. Then the display flashes again.
   Call up further addresses with ⊕ or ⊖.
4. Press ⏻ and 🚿 simultaneously for approx. 1 second.

Summary

Coding in the factory setting		Possible change	
System design			
00: 1	No function	00: 0	Boiler control connected to the cascade; this automatically occurs if 01: 2 has been programmed
System type			
01: 1	Single boiler system	01: 2	Multi-boiler system with cascade control via LON BUS (e.g. Vitocontrol-S, VD2/CT3/CM2)
		01: 3	Do not adjust
Boiler/burner			
02: 1	Two-stage burner	02: 0	Single stage burner
		02: 2	Modulating burner
03: 0	Gas-fired operation	03: 1	Oil-fired operation (non-reversible)
		03: 2	This occurs automatically, if an incorrect or no boiler coding card at all is inserted
Burner (mod.) (see page 97)			
05: 70	Burner curve	05: 0	Linear burner curve
		05: 1 to 05: 99	Non-linear burner curve (see page 97): $\frac{P_T \text{ in kW}}{P_{max} \text{ in kW}} \times 100\ \%$ $= P_T$ in % P_T Partial output at 1/3 of the burner actuator operating time P_{max} Maximum output

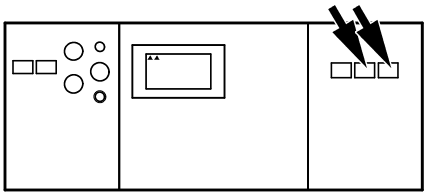
Coding 1 *(continued)*

Coding in the factory setting		Possible change	
Boiler/burner			
06: 87	Maximum boiler water temperature limit: 87°C / 189°F	06: 20 to 06:127	Maximum boiler water temperature limit adjustable from 20 to 127°C / 68 to 261°F
Boiler			
07: 1	Consecutive boiler number in multi-boiler systems (in conjunction with coding address 01)	07: 2 to 07: 4	Consecutive boiler number in multi-boiler systems (in conjunction with coding address 01)
Burner (two stage/mod.) (see page 96)			
08:*1	Maximum burner output in kW	08: 0 to 08:199	Maximum output adjustable from 0 to 199 kW; 1 setting step = 1 kW
09:*1	Maximum burner output in kW	09: 0 to 09:199	Maximum output adjustable from 0 to 19,900 kW; 1 setting step = 100 kW
0A:*1	Burner base output in percent	0A: 0 to 0A:100	$\frac{P_G \text{ in kW}}{P_{max} \text{ in kW}} \times 100$ % $= P_G$ in % P_G Base output P_{max} Maximum output
Burner (mod.) (see page 97)			
15: 10	Burner actuator run time: 10 seconds	15: 5 to 15:199	Operating time adjustable from 5 to 199 seconds for Vitocrossal 300 with MatriX burner Set ■ Type CM3 and CU3: 15: 64 ■ Type CV3: 15: 19
General			
40:125	Actuator operating time for isolation valve, three-way mixing valve or mixing valve motor in conjunction with return temperature control 125 seconds	40: 5 to 40:199	Operating time adjustable from 5 to 199 seconds
77: 1	LON participant number	77: 2 to 77: 99	LON participant number, adjustable from 1 to 99 **Please note:** Allocate each number **only once**.

*1 The factory setting is defaulted by the boiler coding card.

Coding 2

Calling up coding 2



1. Press ↩ and 🚿↩ simultaneously for approx. 2 seconds, until the first two arrows appear in the display; confirm with OK
2. Select the required coding address with ⊕ or ⊖; the address flashes; confirm with OK, the value flashes.
3. Change the value with ⊕ or ⊖; confirm with OK.
   The value is saved and does not flash for approx. 2 seconds. Then the display flashes again.
   Call up further addresses with ⊕ or ⊖.
4. Press ↩ and 🚿↩ simultaneously for approx. 1 second.

Overall summary

Coding in the factory setting		Possible change	
System design			
00: 1	No function	00: 0	Boiler control connected to the cascade; this automatically occurs if 01: 2 has been programmed
System type			
01: 1	Single boiler system	01: 2	Multi-boiler system with cascade control via LON BUS (e.g. Vitocontrol-S, VD2/CT3/CM2, type MW1)
		01: 3	Do not adjust
Boiler/burner			
02: 1	Two-stage burner	02: 0	Single stage burner
		02: 2	Modulating burner
03: 0	Gas-fired operation	03: 1	Oil-fired operation (non-reversible)
		03: 2	This occurs automatically, if an incorrect or no boiler coding card is inserted
04:*1	Switching differential (Please note: see page 163)	04: 0	Switching differential 4°C / 7.2°F
		04: 1	Heat demand-dependent switching differential: ERB50 function (values from 6 to 12°C / 10.8 to 21.6°F)
		04: 2	ERB80 function (values from 6 to 20°C / 10.8 to 36°F)

*1 *The factory setting is defaulted by the boiler coding card.*

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
Burner (mod.) (see page 97)			
05: 70	Burner curve	05: 0	Linear burner curve
		05: 1 to 05: 99	Non-linear burner curve (see page 97): $\frac{P_T \text{ in kW}}{P_{max} \text{ in kW}} \times 100\ \%$ $= P_T$ in % P_T Partial load at 1/3 of the burner actuator operating time P_{max} Maximum output
Boiler/burner			
06: 87	Maximum boiler water temperature limit: 87°C / 186°F	06: 20 to 06:127	Maximum boiler water temperature limit adjustable from 20 to 127°C / 68 to 127°F
Boiler			
07: 1	Consecutive boiler number in multi-boiler systems (in conjunction with coding address 01)	07: 2 to 07: 4	Consecutive boiler number in multi-boiler systems (in conjunction with coding address 01)
Burner (two stage/mod.) (see page 96)			
08:*1	Maximum burner output in kW	08: 0 to 08:199	Maximum output adjustable from 0 to 199 kW; 1 setting step = 1 kW
09:*1	Maximum burner output in kW	09: 0 to 09:199	Maximum output adjustable from 0 to 19.900 kW; 1 setting step = 100 kW
0A:*1	Burner base output in percent	0A: 0 to 0A:100	$\frac{P_G \text{ in kW}}{P_{max} \text{ in kW}} \times 100\ \%$ $= P_G$ in % P_G Base output P_{max} Maximum output

*1 *The factory setting is defaulted by the boiler coding card.*

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
Boiler			
0C: 5	Isolation valve modulating independently of set boiler water temperature	0C: 0	No function
		0C: 1	Constant control of return temperature
		0C: 2	Controlled with time-delay isolation valve
		0C: 3	Isolation valve controlled via boiler water temperature
		0C: 4	Isolation valve modulating subject to set boiler water temperature
0d: 2	With Therm-Control, affects isolation valve (function inactive, if 0C : 1 is programmed)	0d: 0	Without Therm-Control
		0d: 1	With Therm-Control, affects mixing valves of downstream heating circuits
Boiler/burner			
13:*1	Shutdown differential in °C / °F: Burner is switched OFF when the set boiler water temperature is exceeded.	13: 0	Without shutdown differential
		13: 2 to 13: 20	Shutdown differential adjustable from 2 to 20 °C / 3.6 to 36 °F
Burner			
14:*1	Minimum operating time in minutes	14: 0 to 14: 15	Minimum operating time adjustable from 0 to 15 minutes
Burner (mod.) (see page 97)			
15: 10	Burner actuator run time: 10 seconds	15: 5 to 15:199	Operating time adjustable from 5 to 199 seconds for Vitocrossal 300 with MatriX burner. Set: ■ Type CM3 and CU3: 15: 64 ■ Type CV3: 15: 19

*1 *The factory setting is defaulted by the boiler coding card.*

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
Burner (two stage/mod.)			
16:*1	Burner offset in °C / °F: Temporary reduction of set boiler water temperature after burner start.	16: 0 to 16: 15	Offset during start-up optimization adjustable from 0 to 15°C / 0 to 27°F
1A:*1	Start-up optimization in minutes	1A: 0 to 1A: 60	Duration of start-up optimisation adjustable from 0 to 60 minutes
Burner			
1b: 60	Time from burner ignition to control unit start: 60 seconds	1b: 0 to 1b:199	Control delay adjustable from 0 to 199 seconds
1C:120	Start-up delay: 120 seconds (only adjustable if no operating signal B4 is available at burner plug 41)	1C: 1 to 1C:199	Start-up delay adjustable from 1 to199 seconds
Boiler			
1F: 0	Flue gas temperature is not monitored for burner maintenance indication	1F: 1 to 1F: 50	With flue gas temperature sensor: Maintenance indication will be issued if flue gas temperature exceeded; adjustable from 10 to 500°C / 50 to 932°F 1 setting step = 10°C / 18°F
Boiler/burner			
21: 0	No run hours interval for burner maintenance	21: 1 to 21:100	Number of run hours by burner before maintenance is adjustable from 100 to 10.000 hours; 1 setting step = 100 hours
23: 0	No time interval for burner maintenance	23: 1 to 23: 24	Time interval adjustable from 1 to 24 months

*1 *The factory setting is defaulted by the boiler coding card.*

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
Boiler/burner			
24: 0	No maintenance indication	24: 1	Maintenance indication in display (address is automatically set and must be manually reset after maintenance has been carried out)
Boiler/burner (two-stage)			
26: 0	Burner fuel consumption (stage 1); no count, if 26: 0 **and** 27: 0 have been programmed	26: 1 to 26: 99	Input of 0.1 to 9.9; 1 setting step = 0.1 litre or gallons/hour*1
27: 0		27: 1 to 27:199	Input of 10 to 1990; 1 setting step = 10 litres or gallons/hour*1
Boiler/burner			
28: 0	No burner interval ignition	28: 1	The burner will be force-started for 30 seconds after 5 hours
Boiler/burner (two-stage)			
29: 0	Burner fuel consumption (stage 2); no count, if 29: 0 **and** 2A: 0 have been programmed	29: 1 to 29: 99	Input of 0.1 to 9.9; 1 setting step = 0.1 litre or gallons/hour*1
2A: 0		2A: 1 to 2A:199	Input of 10 to 1990; 1 setting step = 10 litres or gallons/hour*1
General			
2b: 5	Maximum pre-heating time of isolation valve: 5 minutes	2b: 0	No pre-heating time
		2b: 1 to 2b: 60	Pre-heating time adjustable from 1 to 60 minutes

*1 *The fuel consumption can only be scanned in conjunction with Vitosoft or Vitocom.*

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
General *(continued)*			
2C: 5	Maximum time delay of isolation valve: 5 minutes	2C: 0	No time delay
		2C: 1 to 2C: 60	Time delay adjustable from 1 to 60 minutes
Boiler			
2d: 0	Shunt pump control function only ON if boiler is enabled	2d: 1	Shunt pump control function ON, independent of whether boiler is enabled or not
General			
40:125	Actuator operating time for isolation valve, three-way mixing valve or mixing valve motor in conjunction with return temperature control: 125 seconds	40: 5 to 40:199	Operating time adjustable from 5 to 199 seconds
4A: 0	Sensor 17 A not installed	4A: 1	Sensor 17 A installed (e.g. Therm-Control temperature sensor); will be recognised automatically
4b: 0	Sensor 17 B not installed	4b: 1	Sensor 17 B installed (e.g. temperature sensor T2); will be recognised automatically
4C: 2	Connection on plug 20 A1: Therm-Control switching contact	4C: 1	Do not adjust
		4C: 3	DHW recirculation pump
4d: 1	Connection on plug 29: Shunt pump	4d: 2	Boiler circuit pump
		4d: 3	Boiler circuit pump with isolation valve function

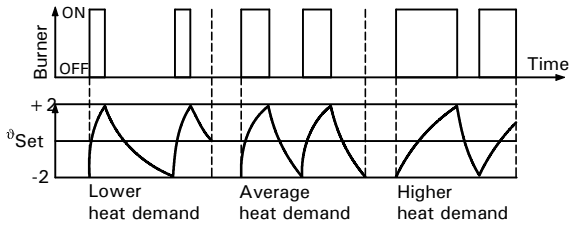
Coding 2 *(continued)*

Coding in the factory setting		Possible change	
General			
4E: 0	Connection on plug [52]: Isolation valve or three-way mixing valve for return temperature control	4E: 1	Do not adjust
4F: 5	Time delay shunt or boiler circuit pump: 5 minutes	4F: 0	No pump time delay
		4F: 1 to 4F: 60	Time delay adjustable from 1 to 60 minutes
General			
76: 0	Without communication module	76: 1	With LON communication module; will be recognized automatically
		76: 2	Do not adjust
77: 1	LON participant number	77: 2 to 77: 99	LON participant number, adjustable from 1 to 99 ***Please note:*** *Allocate each number **only once**.*
78: 1	Enable LON communication	78: 0	Disable LON communication
79: 0	Control unit is not fault manager	79: 1	Control unit is fault manager
80: 1	A fault message is issued if a fault is active for at least 5 seconds	80: 0	Immediate fault message
		80: 2 to 80:199	Minimum fault duration before displaying a fault message is adjustable from 10 to 995 seconds; 1 setting step = 5 seconds
88: 0	Temperature display in Celsius	88: 1	Temperature display in Fahrenheit
8A:175	Display of codings which can be adjusted with system layout	8A:176	Display of all codings, irrespective of system layout or connected accessories
92:160	Do not adjust Address will only be displayed if 8A: 176 has been programmed.		
93: 0	Central fault message during economy mode/service indication does not affect central fault messages	93: 1	Central fault message during economy mode/service indication does affect central fault messages
94: 0	Without plug-in adaptor for external safety equipment	94: 1	With plug-in adaptor for external safety equipment; will be recognized automatically
98: 1	Viessmann system number (in conjunction with monitoring several systems within one LON system via Vitocom 300)	98: 1 to 98: 5	System number adjustable from 1 to 5
9b: 0	No function	9b: 1 to 9b:127	Do not adjust
9C: 20	Monitoring LON participants: When there is no response from a participant, values defaulted inside the control unit continue to be used for a further 20 minutes. Only then will a fault message be triggered.	9C: 0	No monitoring
		9C: 5 to 9C: 60	Time adjustable from 5 to 60 minutes
9d: 0	No function	9d: 1	Do not adjust

Burner switching differential

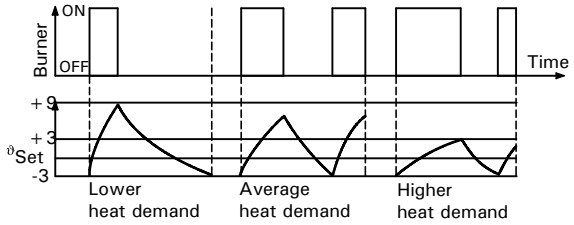
For adjustment, see coding 04 on page 156.

Switching differential 4°C / 7°F **(coding 04: 0)**

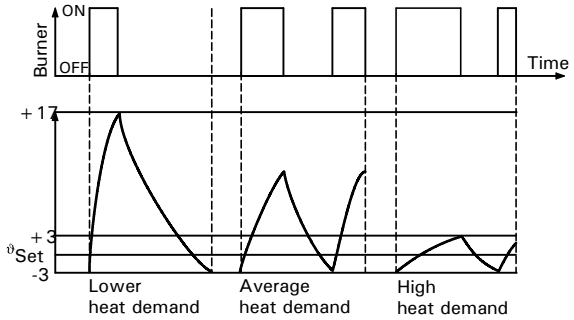


Heat demand-dependent switching differential

ERB50 function (coding 0 : 1)
Subject to heat demand, values between 6 and 12°C / 11 and 22 °F result.

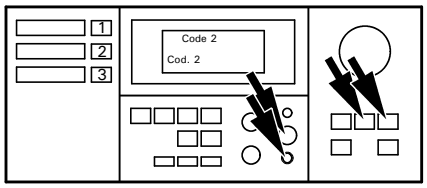


ERB80 function (coding 04: 2)
Subject to heat demand, values between 6 and 20°C / 11 to 36°F result.



The heat demand-dependent switching differential takes the boiler load into account. The switching differential, i.e. the burner operating time, changes based on current heat demand.

Resetting codings to the factory setting

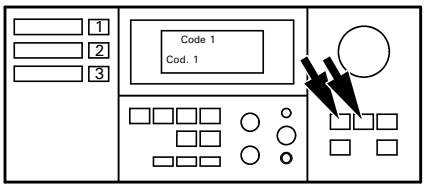


1. Press and simultaneously for approx. two seconds.

2. Press .
   Confirm Base setting? "Yes" with (OK).
   Select Base setting "Yes" or Base setting "No" with ⊕ or ⊖.

Coding 1

Calling up coding 1



1. Press ⏻ and 🛏 simultaneously for approx. 2 seconds.
2. Select the required coding address with ⊕ or ⊖;
   the address flashes;
   confirm with OK,
   the value flashes.
3. Change the value with ⊕ or ⊖;
   confirm with OK.
   The display briefly shows Adopted, then the address flashes again.
   Call up further addresses with ⊕ or ⊖.
4. Press ⏻ and 🛏 simultaneously for approx. 1 second.

Summary

Coding in the factory setting		Possible change	
System design			
00: 1	System circuit A1, without DHW heating	00: 2	System circuit A1, with DHW heating
		00: 3	Mixing valve circuit M2, without DHW heating
		00: 4	Mixing valve circuit M2, with DHW heating
		00: 5	Boiler circuit A1 and mixing valve circuit M2, without DHW heating
		00: 6	Boiler circuit A1 and mixing valve circuit M2, with DHW heating
		00: 7	Mixing valve circuit M2 and M3, without DHW heating
		00: 8	Mixing valve circuit M2 and M3, with DHW heating
		00: 9	Boiler circuit A1 and mixing valve circuits M2 and M3, without DHW heating
		00: 10	Boiler circuit A1 and mixing valve circuits M2 and M3, with DHW heating
Number of boilers			
35: 4	4 boilers connected to Vitocontrol-S, VD2/CT3	35: 1 to 35: 3	1 to 3 boilers connected to Vitocontrol-S, VD2/CT3

Coding 1 *(continued)*

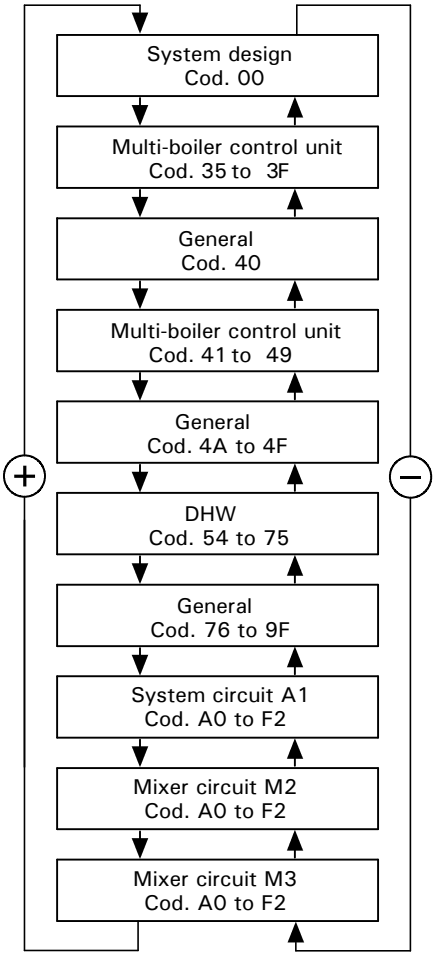
Coding in the factory setting		Possible change	
Multi-boiler control unit			
36: 0	Electronic minimum system supply temperature limit set to 0°C / 32°F	36: 1 to 36:127	Electronic minimum system supply temperature limit adjustable from 0 to 127°C / 32 to 261°F
37: 80	Electronic maximum system supply temperature limit set to 80°C / 176°F	37: 20 to 37:127	Electronic maximum system supply temperature limit adjustable from 20 to 127°C / 68 to 261°F
Control type			
3b: 1	Autonomous boiler parallel connection with supply temperature sensor	3b: 0	Autonomous boiler parallel connection without supply temperature sensor
		3b: 2	Autonomous boiler series connection without supply temperature sensor
		3b: 3	Autonomous boiler series connection with supply temperature sensor
		3b: 4	Sequential type of control with supply temperature sensor
Control strategy			
3C: 2	Net calorific strategy 2 (see page 127)	3C: 0	Gross calorific strategy (see page 126)
		3C: 1	Net calorific strategy 1 (see page 127)
General			
40:125	Actuator operating time for isolation valve, three-way mixing valve or mixing valve motor in conjunction with permanent return temperature control: 125 seconds	40: 5 to 40:199	Operating time adjustable from 5 to 199 seconds

Coding 1 *(continued)*

Coding in factory setting		Possible change	
General *(continued)*			
77: 5	LON participant number	77: 1 to 77: 99	LON participant number, adjustable from 1 to 99 **Please note**: Allocate each number **only once**.
DHW priority A1			
A2: 2	DHW tank priority applicable to heating circuit pump	A2: 0	Without DHW tank priority applicable to heating circuit pump
		A2: 1 A2: 3 to A2: 15	No function
Summer econ. A1			
A5: 5	With heating circuit pump logic function	A5: 0	Without heating circuit pump logic function
Supply min. temp. A1			
C5: 20	Electronic minimum supply temperature limit: 20°C / 68°F	C5: 1 to C5:127	Min. limit adjustable from 1 to 127°C / 24 to 261°F; only effective with room heating with normal temp.
Supply max. temp. A1			
C6: 75	Maximum supply temperature limit 75°C / 176°F	C6: 10 to C6:127	Maximum limit adjustable from 10 to 12°C / 50 to 261°F
DHW priority M2/M3			
A2: 2	DHW tank priority applicable to heating circuit pump and mixing valve	A2: 0	Without DHW tank priority applicable to heating circuit pump and mixing valve
		A2: 1	DHW tank priority only applicable to mixing valve
		A2: 3 to A2: 15	Do not adjust
Coding in the factory setting		**Possible change**	
Summer econ. M2/M3			
A5: 5	With heating circuit pump logic function	A5: 0	Without heating circuit pump logic function
Supply min. temp. M2/M3			
C5: 20	Electronic minimum supply temperature limit: 20°C / 68°F	C5: 1 to C5:127	Minimum limit adjustable from 1 to 127°C / 34 to 261°F; only effective with room heating with normal temperature
Supply max. temp. M2/M3			
C6: 75	Maximum supply temperature limit: 75°C / 167°F	C6: 10 to C6:127	Maximum limit adjustable from 10 to 127°C / 50 to 261°F

Coding 2

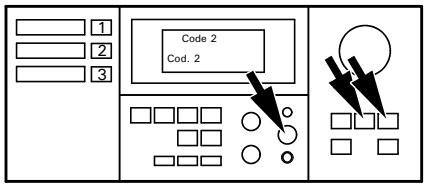
The summary from page 168 lists all possible coding addresses.



The coding addresses are grouped in accordance with the adjacent sequence.

Initially the possible coding addresses A0 to F2 for the system circuit A1 are scrolled through, then those for mixing valve circuits M2 and M3, again starting with coding address A0.

Calling up coding 2



1. Press and simultaneously for approx. 2 seconds; confirm with OK.
2. Select the required coding address with + or −; the address flashes; confirm with OK, the value flashes.
3. Change the value with + or −; confirm with OK. The display briefly shows adopted, then the address flashes again. Call up further addresses with + or −.
4. Press and simultaneously for approx. one second.

Coding 2 *(continued)*

Overall summary

Coding in the factory setting		Possible change	
System design			
00: 1	See page 164		
Multi-boiler control unit			
35: 4	4 boilers connected to Vitocontrol-S, VD2/CT3/CM2	35: 1 to 35: 3	1 to 3 boilers connected to Vitocontrol-S, VD2/CT3/CM2
36: 0	Electronic minimum system supply temperature limit set to 0°C / 32°F	36: 1 to 36:127	Electronic minimum system supply temperature limit adjustable from 0 to 127°C / 32 to 261°F
37: 80	Electronic maximum system supply temperature limit set to 80°C / 176°F	37: 20 to 37:127	Electronic maximum system supply temperature limit adjustable from 20 to 127°C / 68 to 261°F
38: 0	No changing of lead boiler and the boiler sequence **Please note:** In multi-boiler systems, where one boiler is permamently provided as standby boiler, change that boiler over to become the active boiler only in longer intervals, e.g. as part of the annually required system inspection.	38: 1	Changing the lead boiler: Every 1st day of the month, the boiler with the burner which has operated for the shortest number of hours, becomes lead boiler
		38: 2 to 38:200	Changing the lead boiler: After 200 to 20 000 run hours, the boiler with the next higher number (coding address 07 of Vitotronic 100) becomes lead boiler; 1 setting step = 100 run hours
39: 0	No permanent lead boiler	39: 1 to 39: 4	Boiler 1, 2, 3 or 4 is permanent lead boiler
3A: 0	No permanent last boiler	3A: 1 to 3A: 4	Boiler 1, 2, 3 or 4 is permanent last boiler
3b: 1	Autonomous boiler parallel connection with supply temperature sensor	3b: 0	Autonomous boiler parallel connection without supply temperature sensor
		3b: 2	Autonomous boiler series connection without supply temperature sensor
		3b: 3	Autonomous boiler series connection with supply temperature sensor
		3b: 4	Sequential type of control with supply temperature sensor
3C: 2	Net calorific strategy 2 (see page 127)	3C: 0	Gross calorific strategy (see page 126)
		3C: 1	Net calorific strategy 1 (see page 127)

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
Multi-boiler control *(continued)*			
3d: 1	Output balance for gross calorific strategy and net calorific strategy 1	3d: 0	No output statement **Please note:** Vitocontrol-S, VD2/CT3/CM2 controls only in accordance with net calorific strategy 2
3E: 0	Common supply pump ON/OFF subject to heat demand	3E: 1	Common supply pump OFF, if external disable (plug [143]) is active
3F: 0	Without DHW tank priority for common supply pump	3F: 1	With DHW tank priority for common supply pump
General			
40:125	Actuator operating time for isolation valve, three-way mixing valve or mixing valve motor in conjunction with permanent return temperature control: 125 seconds	40: 5 to 40:199	Operating time adjustable from 5 to 199 seconds
41: 31	No ECO threshold boiler 1	41:–30 to 41:+30	ECO threshold boiler 1 adjustable from –30 to +30°C / –22 to +86°F
42: 31	No ECO threshold boiler 2	42:–30 to 42:+30	ECO threshold boiler 2 adjustable from –30 to +30°C / –22 to +86°F
43: 31	No ECO threshold boiler 3	43:–30 to 43:+30	ECO threshold boiler 3 adjustable from –30 to +30°C / –22 to +86°F
44: 31	No ECO threshold boiler 4	44:–30 to 44:+30	ECO threshold boiler 4 adjustable from –30 to +30°C / –22 to +86°F
45: 60	Start-up integral threshold set to 60 Kelvin × minute	45: 1 to 45:255	Start-up integral threshold adjustable from 1 to 255 Kelvin × minute **Please note:** If the threshold is exceeded, one boiler or one burner stage is switched ON
46: 40	Shutdown integral threshold set to 40 Kelvin × minute	46: 1 to 46:255	Shutdown integral threshold adjustable from 1 to 255 Kelvin × minute **Please note:** If the threshold is exceeded, one boiler or one burner stage is switched OFF
47: 15	Shutdown differential set to 15°C / 27°F	47: 2 to 47: 30	Shutdown differential adjustable from 2 to 30°C / 3.6 to 54°F **Please note:** One boiler or one burner stage will be switched OFF, if actual supply temperature exceeds the set supply temperature by this value

Coding 2 *(continued)*

Coding in factory setting		Possible change	
Multi-boiler control *(continued)*			
48: 35	Only for sequential type of control: Control amplification of supply temperature set to 3.5 %/K	48: 1 to 48:199	Control amplification adjustable from 0.1 to 19.9 %/K 1 setting step = 0.1 %/K
49: 40	Only for sequential type of control: Control integral time of supply temperature set to 400 seconds	49: 1 to 49:199	Control integral time adjustable from 10 to 1990 seconds 1 setting step = 10 seconds
General			
4A: 0	Sensor 17 A not installed	4A: 1	Sensor 17 A installed (e.g. temperature sensor T1); will be recognised automatically
4b: 0	Sensor 17 B not installed	4b: 1	Sensor 17 B installed (e.g. temperature sensor T2); will be recognised automatically
4C: 0	Connection on plug 20 A1: Heating circuit pump	4C: 1	Primary pump – DHW tank heating system
		4C: 2	Do not adjust
		4C: 3	Do not adjust
4d: 1	Connection on plug 29: Shunt pump	4d: 0	Common supply pump
4E: 0	Connection on plug 52 A1: 3-way mixing valve for controlling return temperature	4E: 1	Three-way mixing valve
4F: 5	Time delay on activation shunt or common supply pump: 5 minutes	4F: 0	No pump time delay
		4F: 1 to 4F: 60	Time delay adjustable from 1 to 60 minutes
54: 0	Without solar control unit	54: 1	With Vitosolic 100; will be recognised automatically
		54: 2	With Vitosolic 200; will be recognised automatically
55: 0	DHW heating, differential ± 2.5°C / 4.5°F	55: 1	Adaptive DHW heating active (speed of temperature rise for DHW tank temperature is taken into account during DHW heating)
		55: 2	DHW tank temperature control with 2 DHW tank temperature sensors
		55: 3	DHW heating system

Coding 2 *(continued)*

Coding in the factory setting		Possible change	
DHW			
56: 0	Setting range for DHW temperature: 10 to 60°C / 50 to 140°F	56: 1	Setting range for DHW temperature: 10 to 95°C / 50 to 203°F ⚠***Safety instructions!*** ■ *Observe the max. permissible DHW temperature* ■ *Change adjustable high limit on boiler controls*
58: 0	Without auxiliary function for DHW heating	58: 1 to 58: 95	Input of a 2nd set DHW value; adjustable from 1 to 95°C / 34 to 203°F **Please note**: The DHW tank is heated to the 2nd set value during the 4th DHW heating phase
59: 0	DHW tank heating: Start-up point – 2.5°C /– 4.5°F Shutdown point + 2.5°C /+ 4.5°F	59: 1 to 59: 10	Start-up point adjustable from 1 to 10°C / 2 to 18°F below set value
5A: 0	No function	5A: 1	Supply temperature demand from DHW tank is maximum value of system
60: 20	During DHW heating, boiler water temperature is max. 20°C / 36°F higher than set DHW temperature	60: 10 to 60: 50	Difference between common supply temperature and set DHW temperature is adjustable from 10 to 50°C / 18 to 90°F
62: 10	DHW recirculation pump will off delay up to max. 10 minutes	62: 0	DHW recirculation pump without off delay
		62: 1 to 62: 15	Off delay adjustable from 1 to 15 minutes
64: 2	During party mode and after external changeover of operating program with permanently normal room temperature: Enable constant DHW heating enabled and DHW recirculation pump ON	64: 0	No DHW heating, DHW recirculation pump OFF
		64: 1	DHW heating and DHW recirculation pump acc. to time program
66: 4	Input of set DHW value: At programming unit and all installed Vitotrol 300 remote control units	66: 0	At programming unit
		66: 1	At programming unit and remote control – system circuit A1
		66: 2	At programming unit and remote control – mixing valve circuit M2
		66: 3	At programming unit and remote control – mixing valve circuit M3
		66: 5	At remote control – system circuit A1
		66: 6	At remote control mixing valve circuit M2
		66: 7	At remote control – mixing valve circuit M3

Coding 2 *(continued)*

Coding in factory setting		Possible change	
DHW *(continued)*			
67: 40	With Vitosolic: 3rd DHW set-point 40°C / 104°F Reloading suppression will be active above set temperature. DHW tank is heated only by solar heating system.	67: 0	Without 3rd DHW set-point
		67: 1 to 67: 95	Input of a 3rd set DHW set point temperature; adjustable from 1 to 95°C / 34 to 203°F
68: 8	With 2 DHW tank temperature sensors (coding 55: 2): DHW tank heating switch-off point with set value × 0.8	68: 2 to 68: 10	Factor adjustable from 0.2 to 1; 1 setting step = 0.1
69: 7	With 2 DHW tank temperature sensors (coding 55: 2): DHW tank heating starting point with set value × 0.7	69: 1 to 69: 9	Factor adjustable from 0.1 to 0.9; 1 setting step = 0.1
70: 0	DHW recirculation pump ON acc. to time program when DHW heating is enabled	70: 1	DHW recirculation pump ON according to time program
71: 0	DHW recirculation pump: ON acc. to time program	71: 1	OFF during DHW heating to first set value
		71: 2	ON during DHW heating to first set value
72: 0		72: 1	OFF during DHW heating to second set value
		72: 2	ON during DHW heating to second set value
73: 0		73: 1 to 73: 6	During time program 1x/h ON for five minutes to 6x/h ON for five minutes
		73: 7	Constantly ON
75: 0	DHW recirculation pump during economy mode: ON acc. to time program	75: 1	OFF
General			
76: 0	Without communication module	76: 1	With LON communication module; will be recognised automatically
77: 5	LON participant number	77: 1 to 77: 99	LON participant number, adjustable from 1 to 99 **Please note**: Allocate each number **only once**
78: 1	Enable LON communication	78: 0	Disable LON communication
79: 1	Control unit is fault manager	79: 0	Control unit is not fault manager
7A: 0	Without central control of heating circuits	7A: 1	With central control of: System boiler circuit A1
		7A: 2	Mixing valve circuit M2
		7A: 3	Mixing valve circuit M3

Coding 2 *(continued)*

Coding in factory setting		Possible change	
General *(continued)*			
7b: 1	Transmitting time via LON BUS	7b: 0	No transmission of time via LON BUS
7E: 0	Without flue gas cascade or with flue gas cascade with negative draft	7E: 1	With flue gas cascade with positive draft
7F: 1	Detached house	7F: 0	Multi-occupancy house
80: 1	A fault message is issued, if a fault is active for at least 5 seconds	80: 0	Immediate fault message
		80: 2 to 80:199	Minimum fault duration before displaying a fault message is adjustable from 10 to 995 seconds; 1 setting step = 5 seconds
81: 1	Automatic daylight saving time changeover **Please note**: Coding addresses 82 to 87 only feasible if coding 81: 1 is set.	81: 0	Manual changeover - daylight saving time
		81: 2	
		81: 3	Accept time via LON
8E: 4	Displaying and acknowledging faults: At programming unit and all installed Vitotrol remote control units	8E: 0	At programming unit
		8E: 1	At programming unit and remote control – system / boiler circuit A1
		8E: 2	At programming unit and remote control – mixing valve circuit M2
		8E: 3	At programming unit and remote control – mixing valve circuit M3
90:128	Time constant for calculating adjusted outdoor temperature: 21.3 hours	90: 0 to 90:199	Fast (low values) or slow (high values) matching of supply temperature subject to set value when outdoor temperature changes; 1 setting step = 10 minutes
91: 0	Without heating program changeover	91: 1	With heating program changeover (connection via plug 143): Changeover affects: System circuit A1
		91: 2	Mixing valve circuit M2
		91: 3	System / Boiler circuit A1 and mixing valve circuit M2
		91: 4	Mixing valve circuit M3
		91: 5	System / Boiler circuit A1 and mixing valve circuit M3
		91: 6	Mixing valve circuits M2 and M3
		91: 7	All heating circuits (A1, M2, M3)

Coding 2 *(continued)*

Coding in factory setting		Possible change	
General *(continued)*			
92:184	Do not adjust Address will only be displayed if 8A: 176 has been programmed.		
82: 3	Daylight saving time starts: March	82: 1 to 82: 12	January to December
83: 5	Daylight saving time starts: last week of month	83: 1 to 83: 5	Week 1 to week 5 of selected month
84: 7	Daylight saving time starts: last day of week (Sunday)	84: 1 to 84: 7	Monday to Sunday
85: 10	Daylight saving time ends: October	85: 1 to 85: 12	January to December
86: 5	Daylight saving time ends: last week of month	86: 1 to 86: 5	Week 1 to week 5 of selected month
87: 7	Daylight saving time ends: last day of week (Sunday)	87: 1 to 87: 7	Monday to Sunday
88: 0	Temperature display in Celsius	88: 1	Temperature display in Fahrenheit
8A:175	Do not adjust!		
94: 0	Without plug-in adaptor for external safety equipment	94: 1	With plug-in adaptor for external safety equipment; will be recognised automatically
96: 1	With mixing valve extension printed circuit board	96: 0	Without mixing valve extension printed circuit board
97: 2	Outdoor temperature at sensor connected to control unit will be transmitted via LON BUS to any connected Vitotronic 050	97: 0	No transmission via LON BUS
		97: 1	Outdoor temperature is adopted from LON BUS
98: 1	Viessmann system number (in conjunction with monitoring several systems within one LON system with Vitocom 300)	98: 1 to 98: 5	System number adjustable from 1 to 5

Coding 2 *(continued)*

Coding in factory setting		Possible change	
General *(continued)*			
99: 0	Connection to terminals 2 and 3 in plug 143 (External disable/external mixing valve close) inactive	99: 1	Contact affects: No function
		99: 2	Mixing valve close: Mixing valve circuit M2
		99: 3	No function
		99: 4	Mixing valve close: Mixing valve circuit M3
		99: 5	No function
		99: 6	Mixing valve close: Mixing valve circuits M2 and M3
		99: 7	No function
		99: 8	External disable
		99: 9	No function
		99: 10	External disable and mixing valve close: Mixing valve circuit M2
		99: 11	No function
		99: 12	External disable and mixing valve close: Mixing valve circuit M3
		99: 13	No function
		99: 14	External disable and mixing valve close: Mixing valve circuits M2 and M3
		99: 15	No function
9A: 0	Connection to terminals 1 and 2 in plug 143 (External mixing valve open) inactive	9A: 1	Contact affects: No function
		9A: 2	Mixing valve open: Mixing valve circuit M2
		9A: 3	No function
		9A: 4	Mixing valve open: Mixing valve circuit M3
		9A: 5	No function
		9A: 6	Mixing valve open: Mixing valve circuits M2 and M3
		99: 7	No function

Coding 2 *(continued)*

Coding in factory setting		Possible change	
General *(continued)*			
9b: 70	Set minimum supply temperature for external demand (input 146): 70°C / 158°F	9b: 0	Input 146 disabled
		9b: 1 to 9b:127	Set temperature adjustable from 1 to 127°C / 34 to 261°F
9C: 20	Monitoring LON participants: When there is no response from a participant, values defaulted inside control unit continue to be used for a further 20 min. Only then will a fault message be triggered.	9C: 0	No monitoring
		9C: 5 to 9C: 60	Time adjustable from 5 to 60 minutes
9d: 0	Without Input Module 0 to 10V	9d: 1	With Input Module 0 - 10V; will be recognized automatically
9F: 8	With mixing valve circuit: Differential temperature 8°C / 14.4°F	9F: 0 to 9F: 40	Differential temperature adjustable from 0 to 40°C / 0 to 72°F
System circuit/mixing valve circuit			
A0: 0	Without remote control	A0: 1	With Vitotrol 200
		A0: 2	With Vitotrol 300
A2: 2	With DHW tank priority applicable to heating circuit pump and mixing valve	A2: 0	Without DHW tank priority applicable to heating circuit pump and mixing valve
		A2: 1	With DHW tank priority for mixing valve: Mixing valve is closed during DHW heating; heating circuit pump operates
		A2: 3 to A2: 15	Do not adjust
A3: 2	Outdoor temp. below 1°C / 34°F: Heating circuit pump ON Outdoor temp. above 3°C / 37°F: Heating circuit pump OFF *For settings below 1°C / 34°F pipes outdoor thermal insulation shell of building can freeze up, particularly during standby mode, e.g. during holidays.*		Heating circuit pump (see back of manual for conversion chart)
		A3: –9	ON at –10°C, OFF at –8°C
		A3: –8	– 9°C, –7°C
		A3: –7	– 8°C, –6°C
		A3: –6	– 7°C, –5°C
		A3: –5	– 6°C, –4°C
		A3: –4	– 5°C, –3°C
		A3: –3	– 4°C, –2°C
		A3: –2	– 3°C, –1°C
		A3: –1	– 2°C, 0°C
		A3: 0	– 1°C, 1°C
		A3: 1	0°C, 2°C
		A3: 2 to A3: 15	1°C, 3°C to 14°C, 16°C

Coding 2 *(continued)*

Coding in factory setting		Possible change	
System circuit/mixing valve circuit *(continued)*			
A4: 0	With frost protection	A4: 1	No frost protection Adjustment only possible if coding A3: –9 is set. *Please observe note regarding coding address A3.*
A5: 5	With heating circuit pump logic function (economy circuit): Heating circuit pump OFF, if outdoor temperature (AT) is 1 K higher than set room temperature (RT_{set}) AT > RT_{set} + 1 K	A5: 0	Without heating circuit pump logic function
		A5: 1 A5: 2 A5: 3 A5: 4 A5: 5 A5: 6 A5: 7 to A5: 15	With heating circuit pump logic function: Heating circuit pump OFF, if AT > RT_{set} + 5 K AT > RT_{set} + 4 K AT > RT_{set} + 3 K AT > RT_{set} + 2 K AT > RT_{set} + 1 K AT > RT_{set} AT > RT_{set} – 1 K to AT > RT_{set} – 9 K
A6: 36	Extended economy function **inactive**	A6: 5 to A6: 35	Extended economy function active, i.e. burner and heating circuit pump will be switched OFF, and mixing valve will be closed at a variable value which is adjustable between 5 and 35°C / 41 and 95°F plus 1°C / 2°F. This value is based on dampened outdoor temperature, comprising actual outdoor temperature and a time constant which takes cooling down of an average building into consideration.
A7: 0	Without mixing valve economy function	A7: 1	With mixing valve economy function (extended heating circuit pump logic). Heating circuit pump also OFF, if mixing valve was closed longer than 12 minutes. Heating circuit pump ON: ■ If mixing valve changes to control mode or ■ After DHW tank heating (for 12 minutes) or ■ If there is a risk of frost
System circuit/mixing valve circuit			
A9: 7	With pump stop function: Heating circuit pump OFF during set-point value changes (by changing operating mode or changes on rotary selector or button)	A9: 0	Without pump stop function
		A9: 1 to A9: 15	Pump stop function adjustable from 1 to 15

Coding 2 *(continued)*

Coding in factory setting		Possible change	
Mixing valve circuit			
AA: 2	With output reduction through temperature sensor 17 A	AA: 0	Without output reduction
		AA: 1	No function
Systems/mixing valve circuit			
b0: 0*1	With remote control: Heating mode/ reduced mode: With outdoor reset	b0: 1	Heating mode: With outdoor reset Reduced mode: With room temperature feed-back
		b0: 2	Heating mode: With room temperature feed-back Reduced mode: With outdoor reset
		b0: 3	Heating mode/ reduced mode: With room temperature feed-back
b1: 0	Do not adjust		
b2: 8*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Room influencing factor 8	b2: 0	No room influence
		b2: 1 to b2: 31	Room influence factor adjustable from 1 to 31
b3: 0*1	Do not adjust		

Coding in factory setting		Possible change		
b5: 0*1	With remote control: Without room temperature dependent heating circuit pump logic function		Heating circuit pump ON at $RT_{actual} > RT_{set} + \Delta T$ OFF, at $RT_{actual} < RT_{set} + \Delta T$	
		b5: 1	ΔT for ON + 4°C / 7°F	ΔT for OFF + 5°C / 9°F
		b5: 2	+ 3°C / 5°F	+ 4°C / 7°F
		b5: 3	+ 2°C / 4°F	+ 3°C / 5°F
		b5: 4	+ 1°C / 2°F	+ 2°C / 4°F
		b5: 5	+ 0°C / 0°F	+ 1°C / 2°F
		b5: 6	- 1°C / 2°F	+ 0°C / 0°F
		b5: 7	- 2°C / 4°F	- 1°C / 2°F
		b5: 8	- 3°C / 5°F	- 2°C / 4°F
b6: 0*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Without quick heat-up/quick setback	b6: 1	With quick heat-up/quick setback (see page 131)	

*1 Change coding – for system circuit A1 only for boilers without lower temperature limit – for mixing valve circuit only, if remote control unit affects this heating circuit.

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Coding 2 *(continued)*

Coding in factory setting		Possible change	
Systems/mixing valve circuit *(continued)*			
b7: 0*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Without start-up optimization	b7: 1	With start-up optimization: Max. offset 2 hours 30 minutes
		b7: 2	Max. off-set 15 hours 50 minutes
b8:10*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Heat-up gradient – start-up optimization 10 minutes/ °C	b8: 11 to b8:255	Heat-up gradient adjustable from 11 to 255 minutes / °C
b9: 0*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Without learning start-up optimization	b9: 1	With learning start-up optimization
C0: 0*1	With remote control: Without shut-down optimization	C0: 1	With shutdown optimization: Max. off-set 1 hour
		C0: 2	Max. off-set 2 hours
C1: 0*1	With remote control: Without shut-down optimization	C1: 1 to C1: 12	With shutdown optimization: Max. off-set from 10 to 120 minutes; 1 setting step = 10 minutes
C2: 0*1	With remote control: Without learning shutdown optimization	C2: 1	With learning shutdown optimization
Mixing valve circuit			
C3:125	Mixing valve operating time: 125 seconds	C3: 10 to C3:255	Operating time adjustable from 10 to 255 seconds
Mixing valve circuit			
C4: 1	System dynamics – mixing valve control characteristics	C4: 0 to C4: 3	Controller responds too quickly (cycles between open and close): Select a higher value. Controller acts too slowly (temperature is not maintained correctly): Select a lower value.
System circuit/mixing valve circuit			
C5: 20	Electronic minimum supply temperature limit: 20°C / 68°F	C5: 1 to C5:127	Minimum limit adjustable from 1 to 127°C / 34 to 261°F; only effective with room heating with normal temperature
C6: 75	Electronic maximum supply temperature limit: 75°C / 167°F	C6: 10 to C6:127	Maximum temperature limit adjustable from 10 to 127°C / 50 to 261°F

*1 Change coding – for system circuit A1 only for boilers without lower temperature limit – for mixing valve circuit only, if remote control unit affects this heating circuit.

Coding 2 *(continued)*

Coding in factory setting		Possible change	
Systems/mixing valve circuit *(continued)*			
C8:31*1	With remote control unit and for heating circuit, operation with room temperature feed-back must be programmed: Without limiting room influence	C8: 1 to C8: 30	Room influence limit adjustable from 1 to 30 K
d5: 0	External heating program changeover via plug 143: Heating program changes to constant operation with reduced room temperature	d5: 1	Heating program changes to constant operation with normal room temperature
E1: 1	With remote control: Normal day temperature is adjustable at remote control unit from 10 to 30°C / 50 to 86°F	E1: 0	Normal day temperature adjustable from 3 to 23°C / 37 to 74°F
		E1: 2	from 17 to 37°C / 63 to 99°F
E2: 50	With remote control: No display correction of actual room temperature	E2: 0 to E2: 49	Display correction – 5 °C / – 9°F to display correction – 0.1°C / – 0.18°F
		E2: 51 to E2: 99	Display correction + 0.1°C / +0.18°F to display correction + 4.9°C / 8.8°F
Mixing valve circuit			
F1: 0	Slab curing function inactive	F1: 1 to F1: 4	Slab curing function adjustable in accordance with four optional temperature-time profiles (see page 183) **Please note:** Observe slab curing supplier's instructions. Observe local regulations. Report to be provided by heating contractor must contain following details: ■ Heat-up data with their respective supply temperatures ■ Max. supply temperature achieved ■ Operating condition and outdoor temperature during handover Function continues after power failure or after control unit has been switched OFF. Heating program will be started, after screed-drying function has been completed or if address is manually set to 0.
Systems/mixing valve circuit			
F2: 8	Time limit for party mode 8 hours*1	F2: 0	No time limit for party mode*1
		F2: 1 to F2: 12	Time limit for party mode adjustable from 1 to 12 hours*1

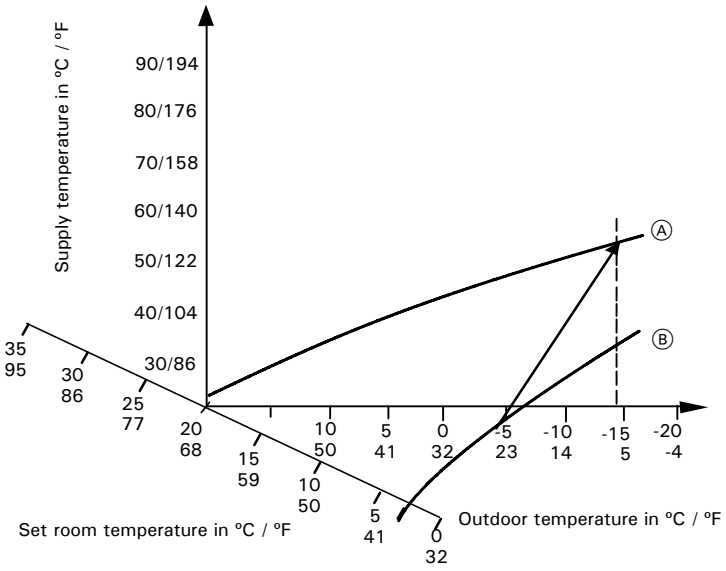
*1 Party mode ends **automatically** with heating program when system changes over to operation with normal room temperature.

Coding 2 *(continued)*

Coding in factory setting		Possible change	
Systems/mixing valve circuit *(continued)*			
F8: -5	With outdoor temperature sensor: Below an outdoor temperature of -5°C / 23°F, the reduced room temperature set-point is raised to an outdoor temperature dependent value according to the set heating curve (up to the temperature limit as defined in coding address F9). See example on next page. Note coding address A3	F8: +10 to F8: -60	Temperature limit for raising the reduced operation adjustable from +10 to -60°C/ +50 to -76°F
		F8: -61	Function not active
F9: -14	With outdoor temperature sensor: Below an outdoor temperature of -14°C / 6.8°F, the reduced room temperature set-point is raised to the value of the normal room temperature set-point. See example on next page.	F9: +10 to F9:-60	Temperature limit for raising the reduced operation adjustable from +10 to -60°C/ +50 to -76°F
FA: 20	With outdoor temperature sensor: Raising of the boiler temperature set-point when switching from reduced room temperature to normal room temperature by 20%. See example on next page.	FA: 0 to F9: 50	Temperature raise can be set from 0 to 50%
Fb: 30	With outdoor temperature sensor: Duration of the raised boiler temperature set point value (see coding address FA): 60 minutes. See example on next page.	Fb: 0 to Fb: 150	Duration can be set from 0 to 300 minutes; 1 setting step = 2 min

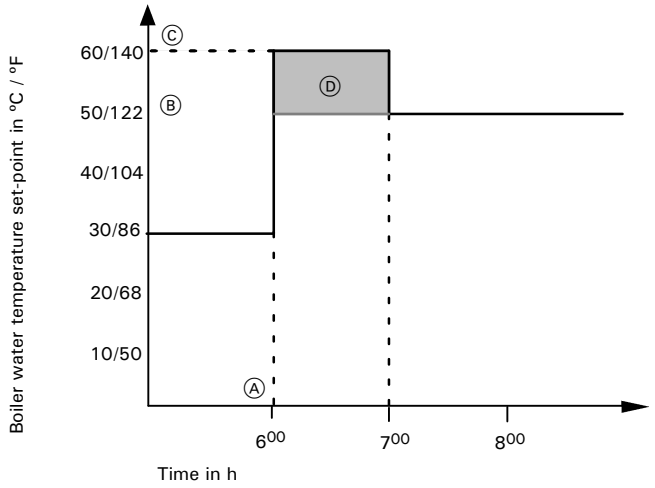
Coding 2 *(continued)*

Example 1 (F8:-5, F9:-14)



ⒶHeating curve for normal room temperature operation
ⒷHeating curve for reduced room temperature operation

Example 2 (FA:20, Fb:30)

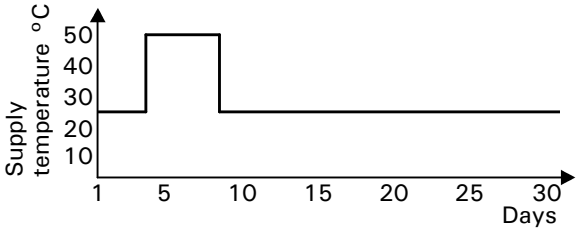


Ⓐ Start of normal room temperature operation
Ⓑ Boiler water temperature set-point according to heating curve
Ⓒ Increased boiler water temperature set-point according to coding address FA:
50°C + 20% = 60°C
122°F + 20% = 146.4°F
Ⓓ Duration of the operation with increased boiler water temperature set-point according to coding address Fb: 60 minutes

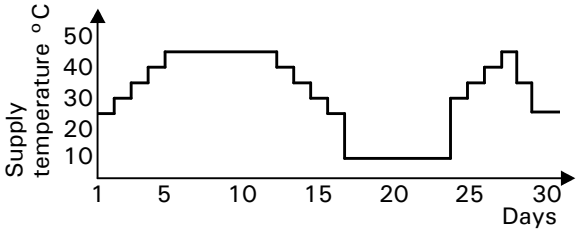
Slab curing function diagram

Coding, see page 180.

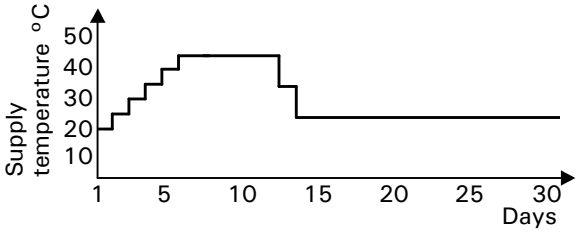
Temperature-time profile 1 (coding F1: 1)
(See back of manual for temperature conversion chart)



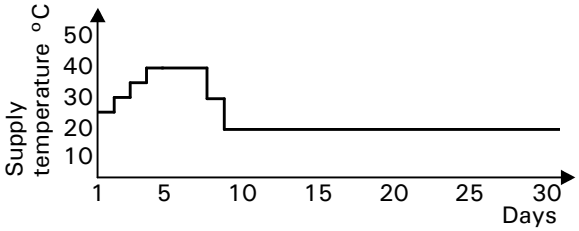
Temperature-time profile 2 (coding F1: 2)



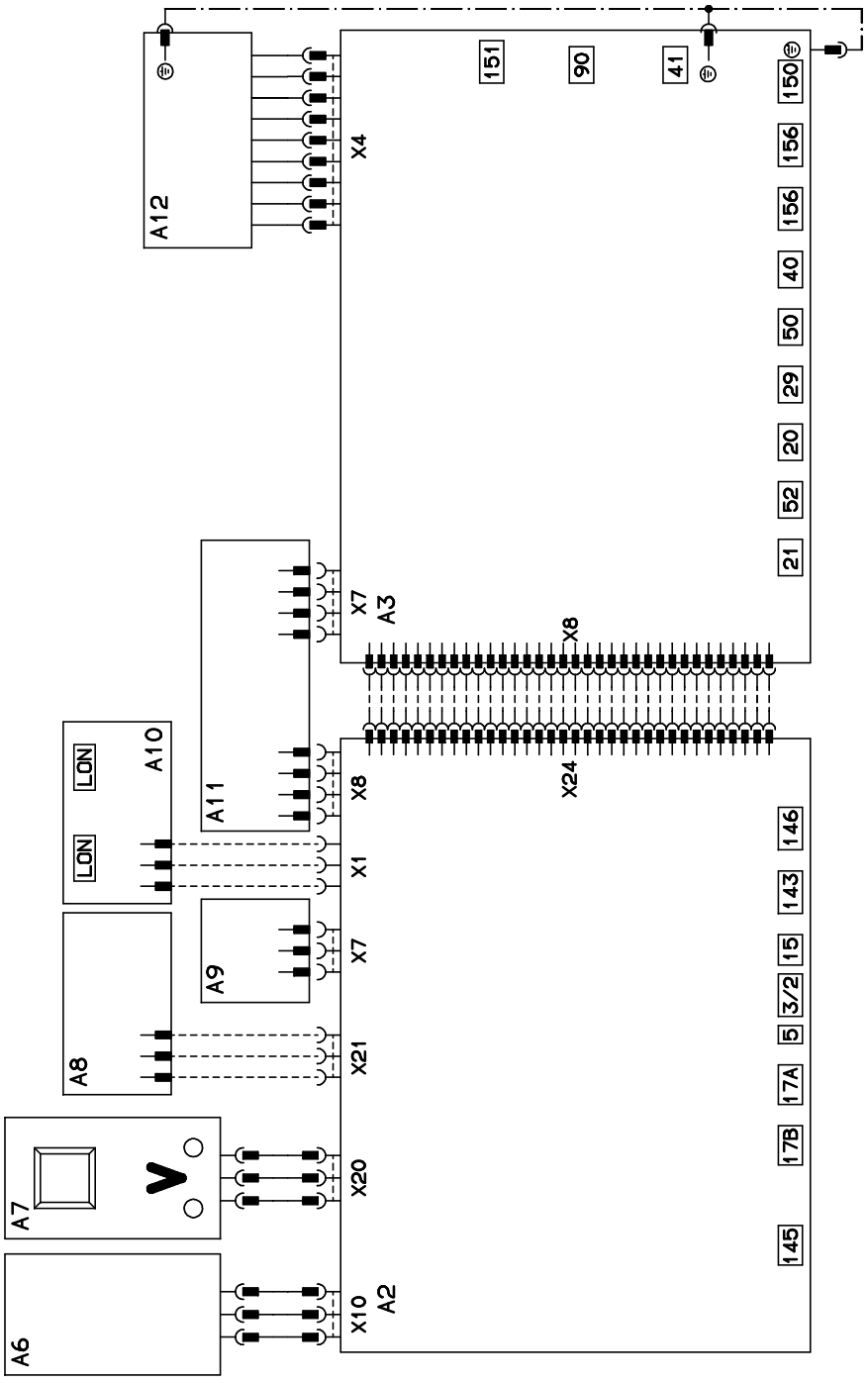
Temperature-time profile 3 (coding F1: 3)



Temperature-time profile 4 (coding F1: 4)

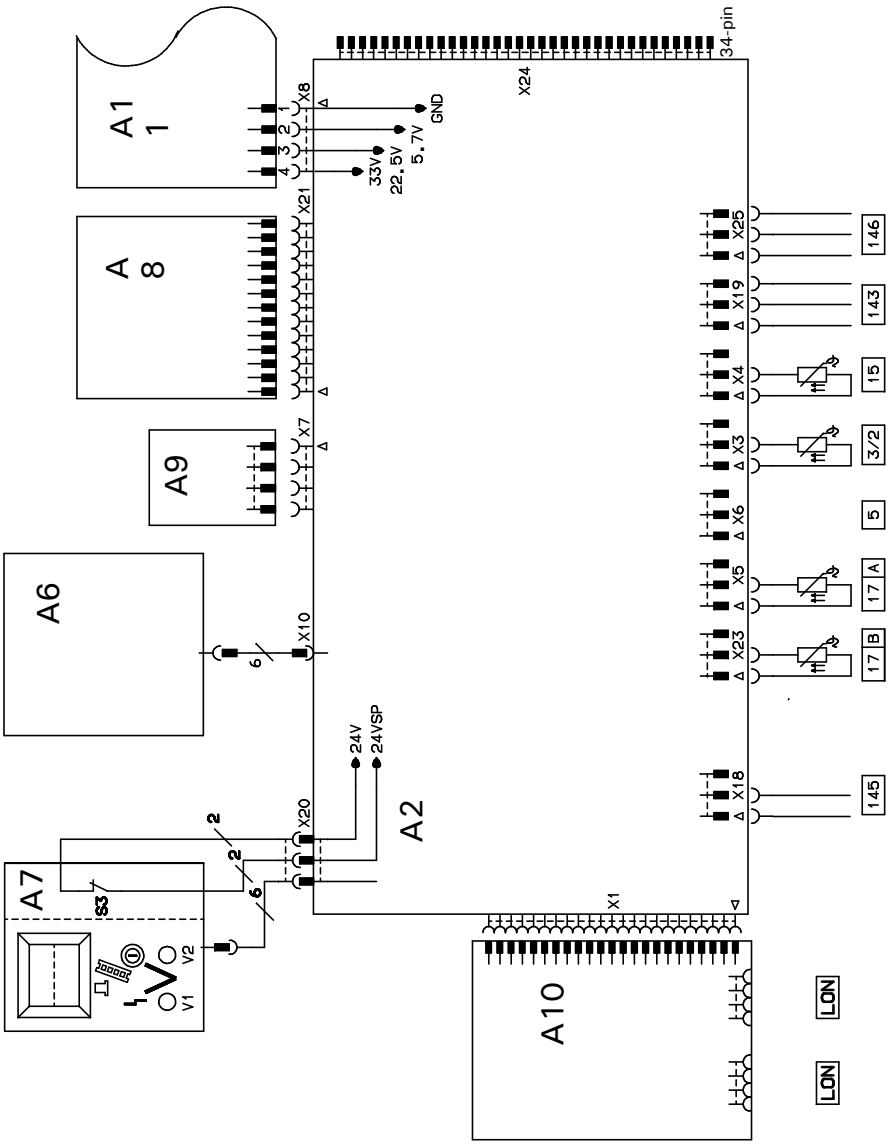


Summary



A2 Low voltage motherboard
A3 Line voltage motherboard
A6 Programming unit
A7 Optolink printed circuit board/override switch
A8 Supplementary printed circuit board
A9 Boiler coding card
A10 LON communication module
A11 Power supply unit printed circuit board
A12 Boiler control unit

Low voltage motherboard



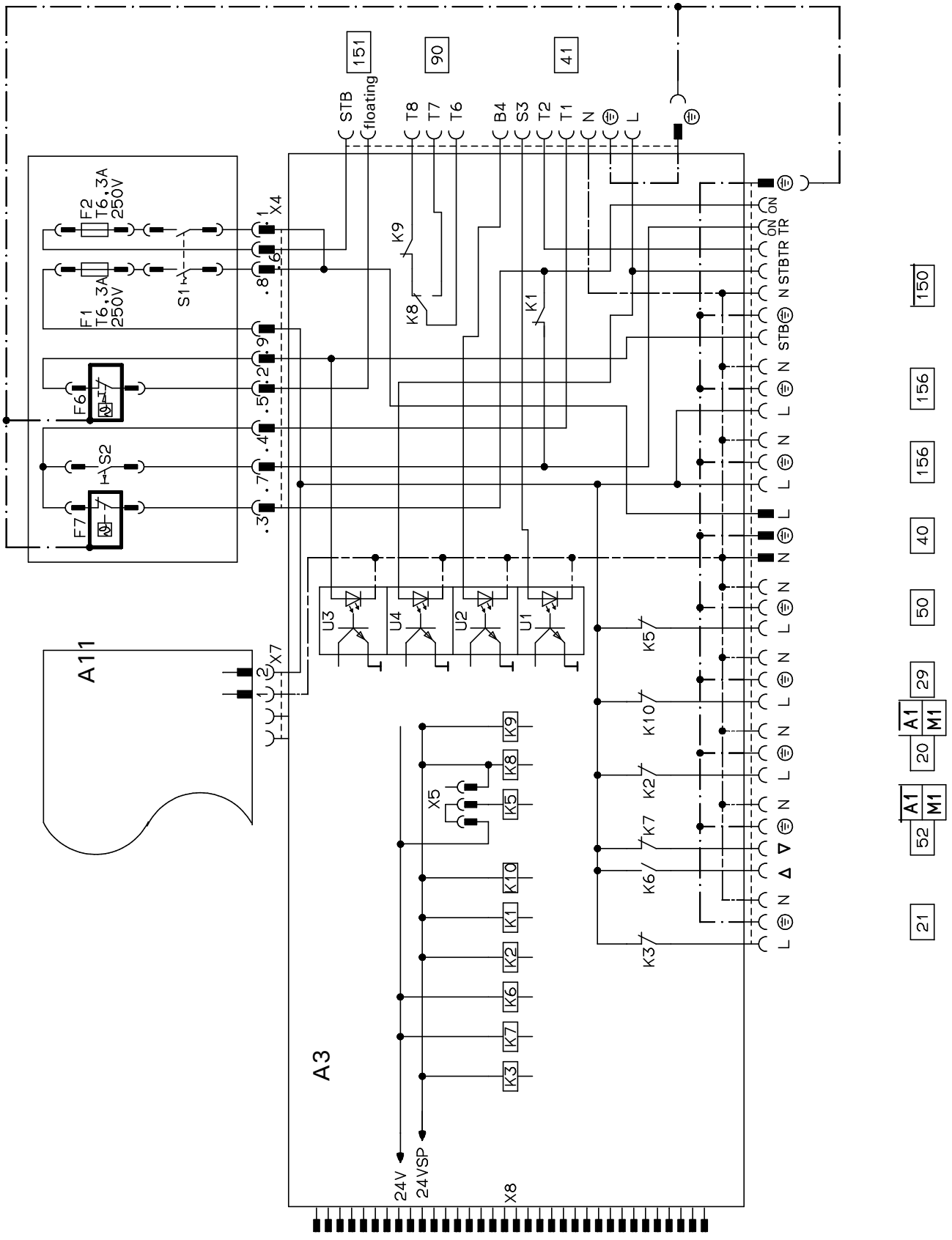
- 3 Boiler temperature sensor
- 5 No function
- 15 Flue gas temperature sensor
- 17 A Temperature sensor T1
- 17 B Temperature sensor T2
- 143 Connection for external equipment
- 145 KM BUS
- 146 Connection for external equipment
- LON Interconnecting cable for data transfer between control units
- S3 Override switch
- V1 Fault indicator (red)
- V2 ON/OFF indicator (green)

Line voltage motherboard

- 20 Control output
- 21 DHW pump
- 29 Shunt or boiler circuit pump
- 40 Power supply, 120 VAC
- 41 Burner, connection to DIN 4791
- 50 Compiled failure alarm
- 52 Boiler isolation valve
  or
  Boiler return valve
- 90 Burner stage 2/mod.
- 150 External connections
  - ⓐ External safety equipment (remove jumper when connecting)
  - ⓑ External disable (remove jumper when connecting)
  - ⓒ External burner activation
- 151 Safety circuit
- 156 Power supply for connection accessories

F1, F2 Fuses
F6 Fixed high limit 110°C / 230°F (99°C / 210°F)
F7 Adjustable high limit 95°C / 203°F (100°C / 212°F)
K1-K10 Relays
S1 ON/OFF switch
S2 Test switch

Line voltage motherboard *(continued)*



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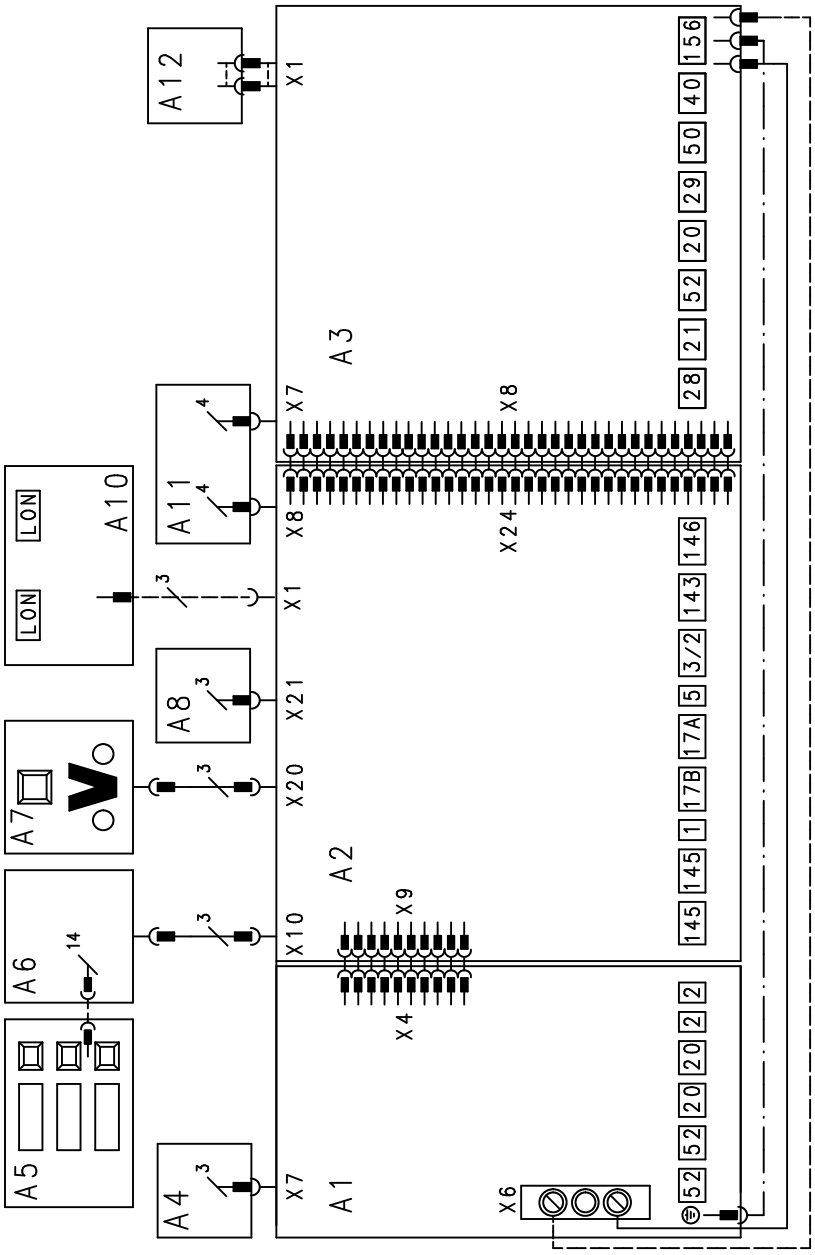
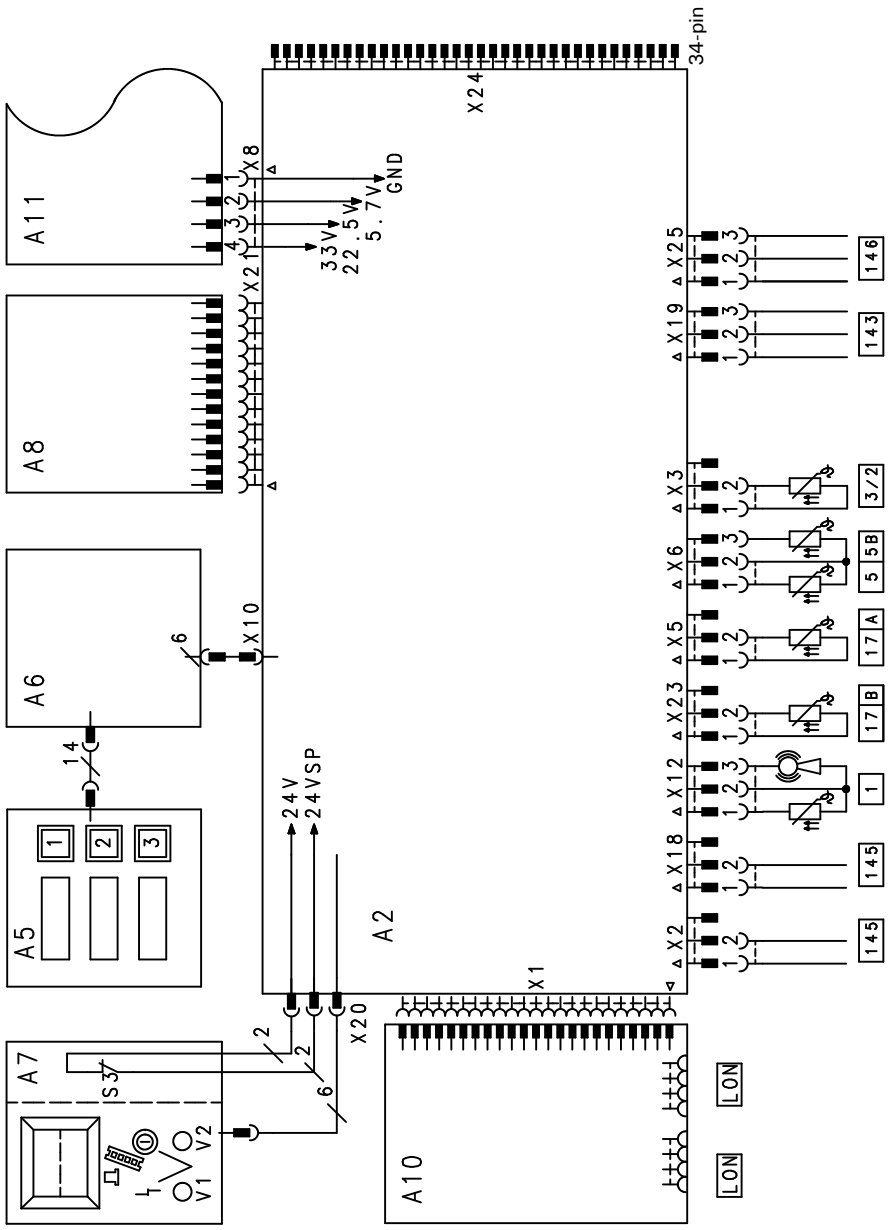
Summary



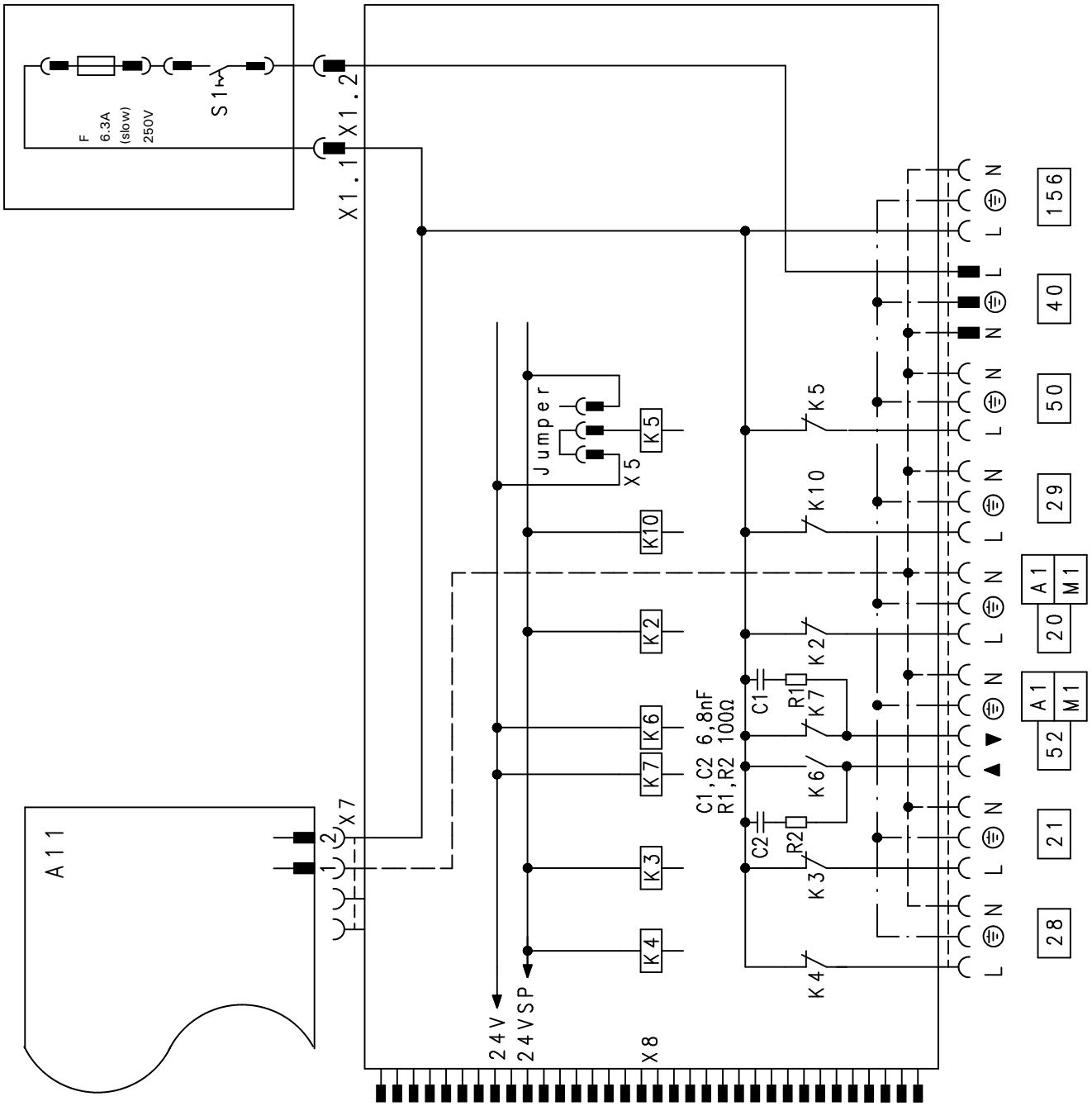
A1 Mixing valve extension board
A2 Low voltage motherboard
A3 Line voltage motherboard
A4 Mixing valve extension supplementary printed circuit board
A5 Heating circuit selection buttons printed circuit board
A6 Programming unit
A7 Printed circuit board Optolink/override switch
A8 Supplementary printed circuit board
A10 LON communication module
A11 Power supply unit printed circuit board
A12 Boiler control unit

Low voltage motherboard



- 1 Outdoor temperature sensor
- 2 Common supply temperature sensor
- 3 No function
- 5 DHW tank temperature sensor
- 17A Temperature sensor T1
- 17B Temperature sensor T2
- 143 Connection for external equipment
- 145 KM BUS
- 146 Connection for external equipment
- LON Interconnecting cable for data transfer between control units
- S3 Override switch
- V1 Fault indicator (red)
- V2 ON/OFF indicator (green)

Line voltage motherboard



20	Heating circuit pump	52	Control of constant return temperature
21	DHW pump (accessory)	156	Power supply for accessories
28	DHW recirculation pump	F	Fuse
29	Shunt or supply pump	K2-K7	Relays
40	Power supply	S1	ON/OFF switch ⏻
50	Compiled/central failure alarm		

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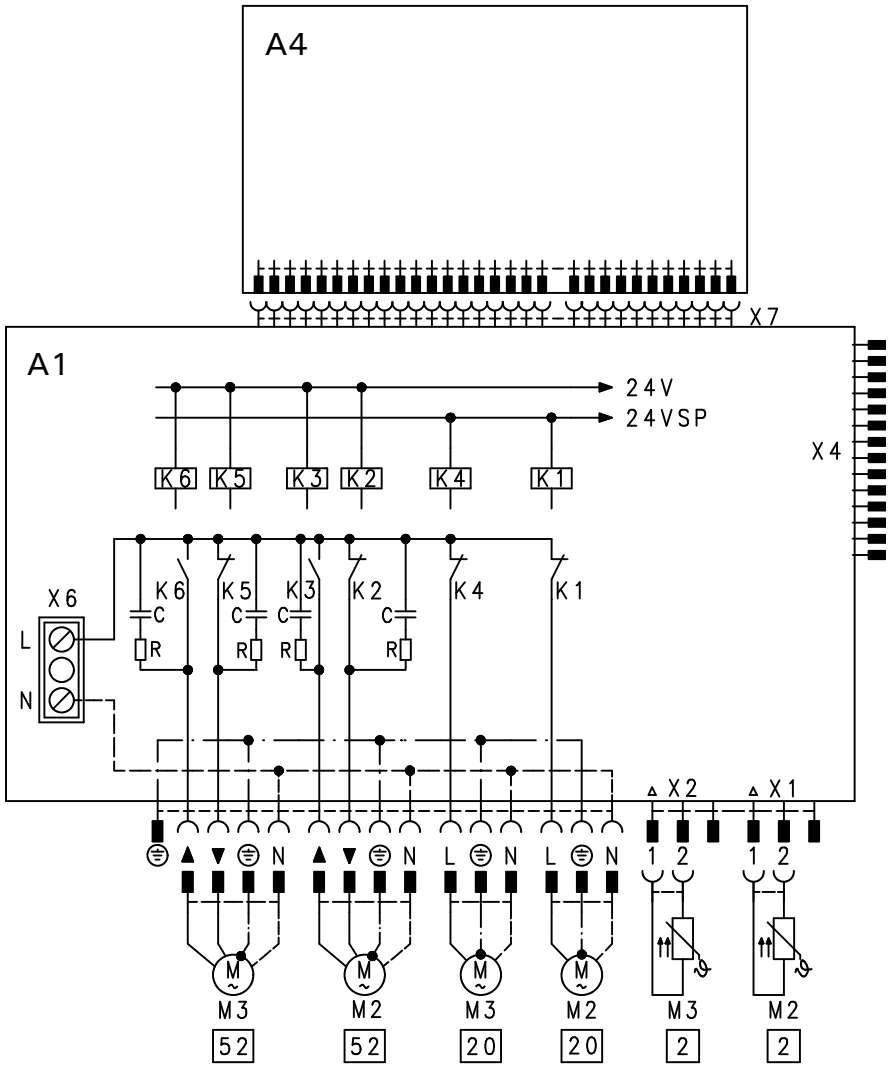
Mixing valve extension Printed Circuit Board



2 Supply temperature sensor
20 Heating circuit pump
52 Mixing valve motor
K1–K6 Relays

Applicability

Vitotronic 100, type GC1,
Order No. 7248 247, from Serial No. 7248 247 □□□□□□□□□□

Vitocontrol-S, VD2/CT3/CM2, 300-K MW1,
Order No. 7248 233, from Serial No. 7248 233 □□□□□□□□□□

Contact your Viessmann representative for information on the Vitotronic 333.

Specification – Vitotronic 100, GC1

Rated voltage: 120VAC
Rated frequency: 60 Hz
Rated current: 2 × 6 A~
Power consumption: 5 W
Safety class: I
Protection: IP 20 D to EN 60529, safeguard through design and installation
Function: Type 1B to EN 60730-1

Permissible ambient temperature:
■ During operation:
. 0 to 40°C
. 32 to 104°F
. Installation in living accommodation
. and boiler rooms (normal ambient ..
. conditions)
■ During storage and transport:
–20 to 65°C
– 4 to 149°F

Relay output rating at 120VAC for:
■ Switching output [20]: 2 FLA*1
■ Shunt or boiler circuit pump [29]: 2 FLA*1
■ Central fault message [50]: 2 FLA*1
■ Isolation valve [52]: 1 FLA*1
or constant return temperature control [52]: 0.1 FLA*1
■ Burner
Plug [41]: 3 FLA
Plug [90]
– two stage: 0.5 FLA
– modulating: 0.1 FLA

*1 *Total max. 6A~.*

Specification – Vitocontrol-S, VD2/CT3/CM2

Rated voltage: 120VAC
Rated frequency: 60 Hz
Rated current: 6 A~
Power consumption: 10 W
Safety class: I
Protection: IP 20 D to EN 60529, safeguard through design and installation
Function: Type 1B to EN 60730-1

Relay output rating at 230 V~ for:
■ Heating circuit pump
. or
. primary pump
. DHW tank heating
. system [20]:
. 2 FLA*1
■ DHW tank
. heating
. pump [21]: 2 FLA*1

■ DHW circulation pump [28]: 2 FLA*1
■ Shunt or distribution pump [29]: 2 FLA*1
■ Central fault message [50]: 2 FLA*1
■ Three-way return valve or isolation valve 0.1 FLA*1

*1 *Total max. 6A~*

Permissible ambient temperature:
■ During operation:
0 to 40°C
32 to 104°F
Installation in living accommodation and boiler rooms (normal ambient conditions)
■ During storage and transport:
–20 to 65°C
– 4 to 149°F

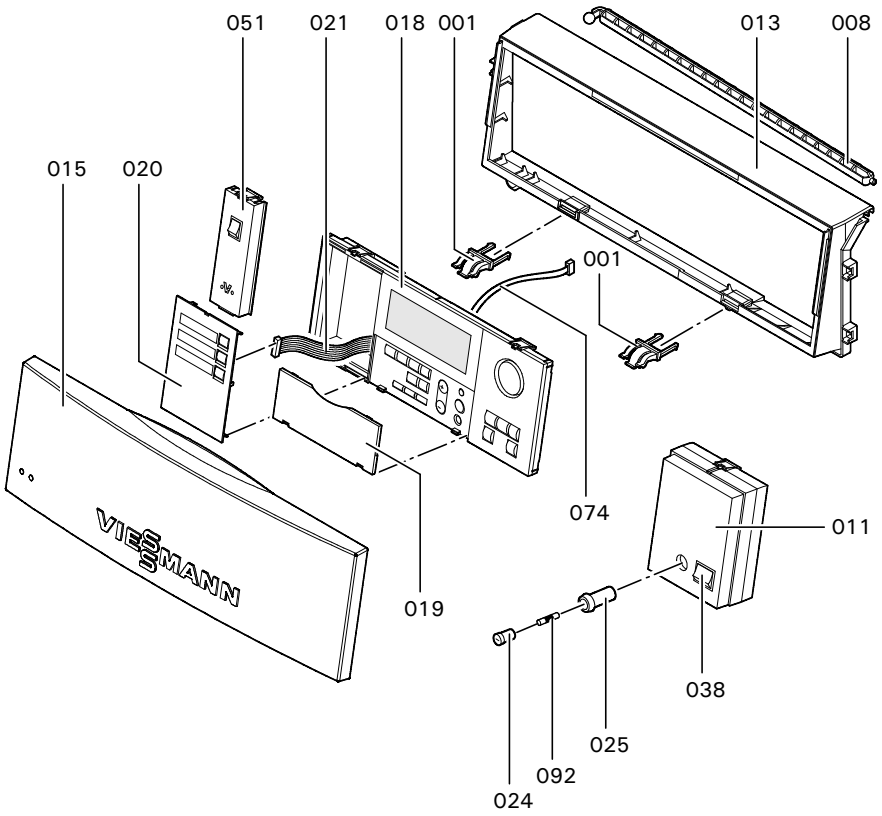
Parts List

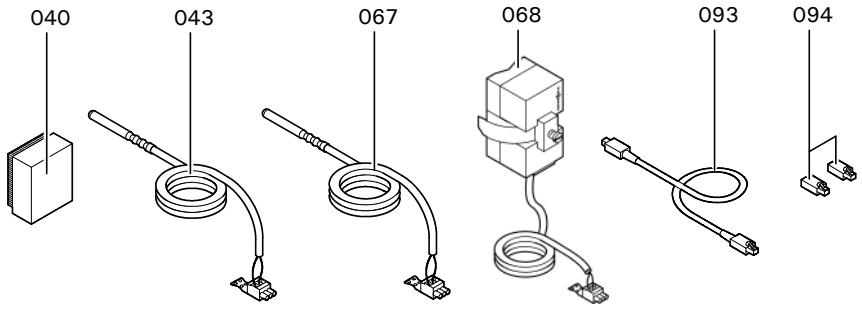
VITOTRONIC 300-K
MW1 Series

Order No.	Serial No. *1
Vitocontrol-S	7134 557, 7134 558
MW1W (shown to right)	7248233□□□□□□□□
Custom Control Panels	7248 234□□□□□□□□
MW1S (not shown)	

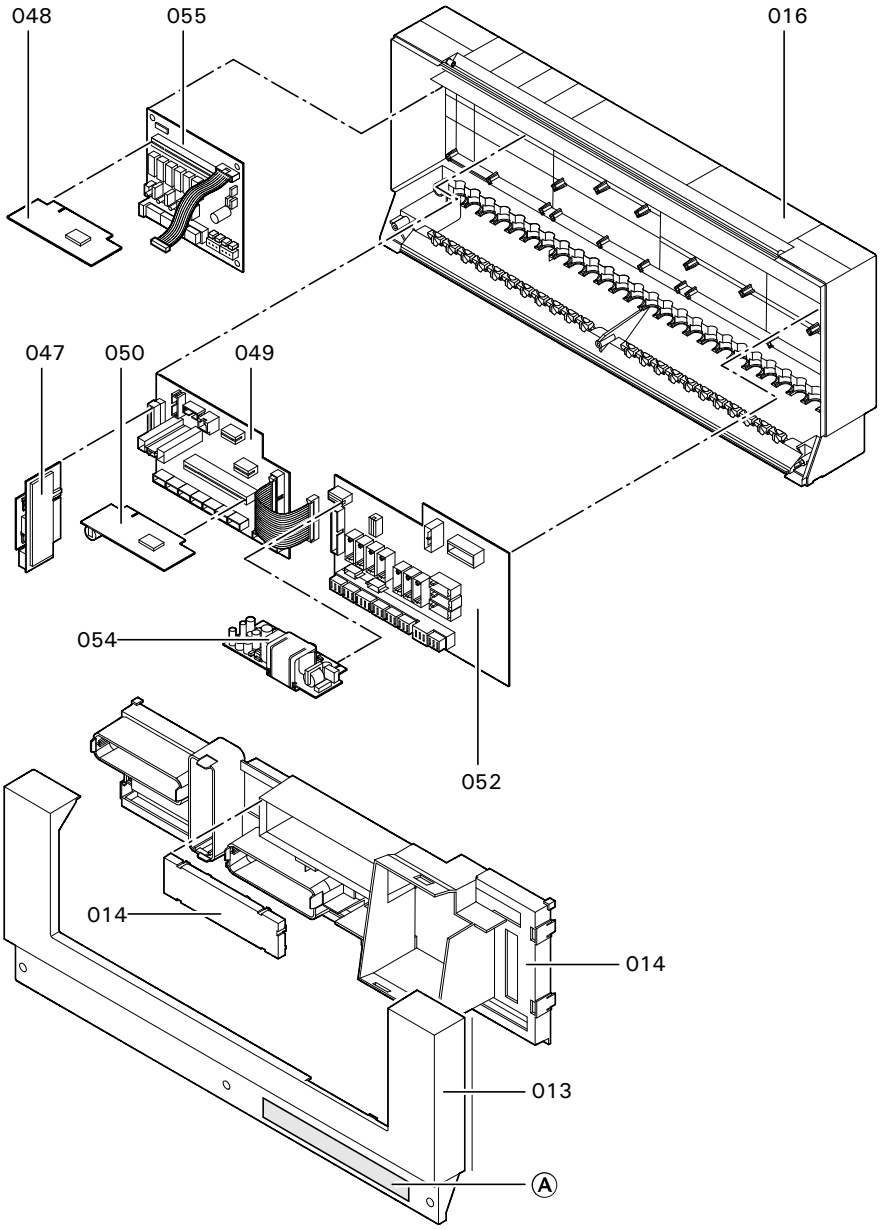
Ordering Replacement Parts:
Please provide product Model and Serial Number from rating plate when ordering replacement parts. Order replacement components from your Viessmann distributor.

Parts
001 Hinges
008 Support arm
011 Power module (wired)
013 Front housing (with Pos. 001)
014 Circuit board enclosure
015 Flip-down cover
016 Rear housing
017 Wall console
018 Programming unit
019 Flip-down cover
020 Front cover (heating circuits)
021 Flat cable, 14-pole
024 Fuse holder cover
025 Fuse holder
038 Switch, 2-pole (power on/off)
040 Sensor #1 for outdoor temp.
043 Sensor #5 for DHW production
047 LON module
048 Circuit board (mixing valve expansion)
049 Motherboard (control, low voltage)
050 Circuit board (control software)
051 Diagnostics module (Optolink)
052 Motherboard (control, line voltage)
054 Circuit board (120V power supply)
055 Motherboard (mixing valve expansion)
067 Sensor (immersion, NI500)
068 Sensor #2 for supply
074 Harness for programming unit
092 Fuse 6.3A / 250V (10 pack)
093 Connecting cable LON (7mtr), RJ45
094 LON terminal resistor (2 pieces)





Parts List *(continued)*



Other Parts (not illustrated)

060 Accessory pack (plugs)
080 Installation / Service Instructions Vitotronic 100/333
081 Operating Instructions, Vitotronic 100/333
082 Parts List, Vitotronic 333
100 Accessory pack (low voltage plugs)
107 Accessory pack (strain reliefs and plugs)

Ⓐ Rating plate

*1 A 16-digit bar-coded Serial No. is printed on the front housing, below the flip-down cover.

Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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Technical information subject to change without notice.

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